ESIE07-09

Service Manual

BMS option for Daikin air cooled chillers with scroll compressor

Gateway	Address card
EKLONPG	EKACPG
EKBNPG	

Table of Contents

1 Introduction

1.1 About This Manual ..... i–i
1.2 Building Management System (BMS) ..... i–ii

Part 1
Address card EKACPG

1 System Outline

1.1 What Is in This Chapter? 1–3
1.2 Communication Outline 1–4
1.3 Installing the address card 1–6
1.4 Connecting the address card 1–8

Part 2
LON

1 Design guide

1.1 What Is in This Chapter? 2–3
1.2 Outline and features 2–4
1.3 System outline 2–5
1.4 System configuration 2–6
1.5 Specifications 2–7
1.6 LON objects 2–11
1.7 Function 2–15
1.8 Wiring diagram 2–16

2 Functional specifications

2.1 What Is in This Chapter? 2–17
2.2 <EKLONPG> LON gateway 2–18

3 Gateway configuration

3.1 What Is in This Chapter? 2–19
3.2 Configuration file 2–20
3.3 Downloading the configuration file to the gateway 2–21

4 Communication procedure

4.1 What Is in This Chapter? 2–31
4.2 LonMaker V3.1 2–32

5 LON objects

6 History

7 Configuration files

Part 3
BACnet

1 Design guide

1.1 What Is in This Chapter? 3–3
1.2 Outline and features 3–4
1.3 System outline 3–5
1.4 System configuration 3–6
1.5 Specifications 3–7
1.6 BACnet object list 3–10
1.7 Function 3–13
1.8 Wiring diagram 3–14

2 Functional specifications

2.1 What Is in This Chapter? 3–15
2.2 Summary 3–16
2.3 BACnet Protocol Implementation Conformance Statement (PICS) 3–17

3 Gateway configuration

3.1 What Is in This Chapter? 3–21
3.2 Configuration file 3–22
3.3 Downloading the configuration file to the gateway 3–24

4 Communication procedure

4.1 What Is in This Chapter? 3–33
4.2 Cimetrics BACnet explorer 3–34
4.3 CAS BACnet explorer 3–39

5 BACnet objects

6 History

7 Configuration files

1 Introduction

1.1 About This Manual

Introduction

The purpose of the address card and the Daikin gateways is to connect the Daikin water chillers to a larger Building Management System (BMS).

There are 3 possibilities with the EKACPG address card:

- EKACPG to connect with a system using Modbus
- EKACPG to connect with a LON gateway
- EKACPG to connect with a BACnet gateway

Before starting up the system for the first time, ensure that it has been properly installed.

Usage of the manual

The present manual gives you all the information you need to do the set up and the troubleshooting related to the BMS option for Daikin air cooled chillers. It is intended for and should only be used by qualified engineers. It is not intended to replace technical know-how acquired through training and experience.

Using icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

Icon	Type of information	Description
	Note	A ‘note’ provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
	Caution	A ‘caution’ is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
	Warning	A ‘warning’ is used when there is danger of personal injury.
	Reference	A ‘reference’ guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

1.2 Building Management System (BMS)

Introduction

As buildings, plants or other sites become too large to control manually, the need for automatic distance control becomes more important. Building Management Systems (BMS) were developed to have a centralized overview of complete sites.

In general, control of lights, elevators, water supply, air conditioning, power consumption, etc. can be controlled by one control system.

Communication

To implement correct communication between the connected subsystems and the control system, the same communication protocol must be used.

Daikin BMS option

The Daikin BMS option makes it possible to connect the Daikin chillers to a larger control system. The tools necessary for this communication are the Gateway and the address cards.

After installing address cards and Gateway, the BMS must be programmed to be able to control and monitor the chillers through the Gateway. To enable this configuration, individual parameters and relative addresses of the chillers are described in this manual.

Part 1
Address card EKACPG

Introduction

The purpose of this part is to describe the communication with the EKACPG address card using Modbus.

Overview

This part contains the following chapter:

Chapter	See page
1 System Outline	1–3

1 System Outline

1.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

Topic	See page
1.2 Communication Outline	1–4
1.3 Installing the address card	1–6
1.4 Connecting the address card	1–8

1

1.2 Communication Outline

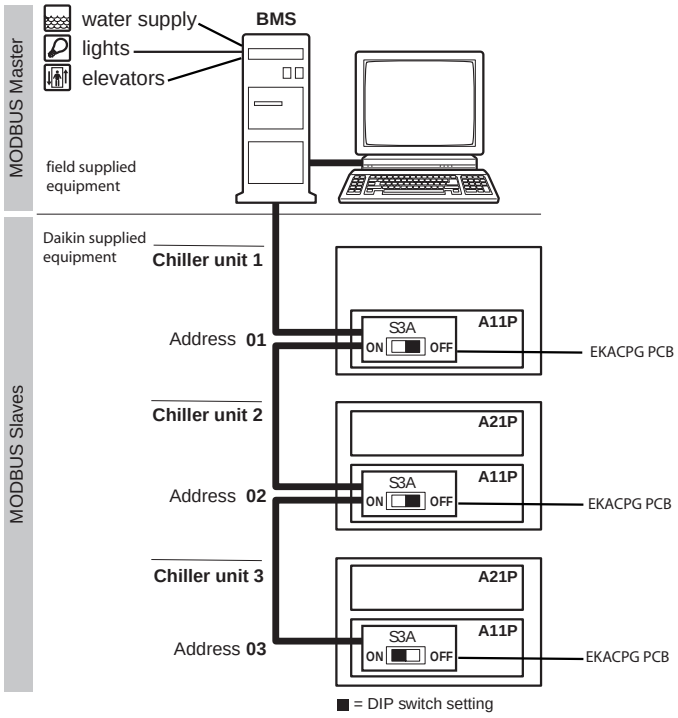
Introduction

The communication between the chiller(s) (slave(s)) and the BMS (master) is possible in Modbus protocol.

The chillers and the address cards are Daikin parts. The other equipment must be field supplied.

Communication outline example

The illustration below shows a communication outline example.



In this example, the last in line DIP switch on the address cards of chiller units 1 and 2 are to be set to OFF. Because chiller unit 3 is the last unit in line, the last in line DIP switch on the address card must be set to ON.

Refer to EKACPG installation manual (ref: 4PW35237-1) and multiscroll installation manuals.

Required settings:

- Modbus address:
  This can be selected, but should match the addresses mention in the gateway config file.
- Baudrate: 19200. Fixed value for setup with gateways.
- Parity: NONE (2STOPb). Fixed value for setup with gateways.
- BMS CONTROL ALLOWED: Y

Example of unit controller settings:

Service menu: Submenu: communication

COMMUNICATION (fourth screen)

RS485	Unit 1 MODBUS	Unit 2 MODBUS	Unit 3 MODBUS	... MODBUS
ADDR: (Address)	01	02	03	...
BR: (Baudrate)	19200	19200	19200	19200
PARITY:	EVEN (1 STOPb)	EVEN (1 STOPb)	EVEN (1 STOPb)	EVEN (1 STOPb)

COMMUNICATION (sixth screen)

	Unit 1	Unit 2	Unit 3	...
BMS CONTROL ALLOWED:	Y	Y	Y	Y

Parts and description

The table below gives a description of the different parts of the communication outline:

Part	Description
BMS	The Building Management System is the customer's control unit. Refer to "Building Management System (BMS)" on page i–ii.
Address card EKACPG	The EKACPG is a small module that should be installed on the A11P PCB panel in the switch box of the chiller.
BMS PC	The BMS PC is the Modbus master through a Modbus interface card. **Note**: the BMS PC is field supplied equipment!

1

1.3 Installing the address card

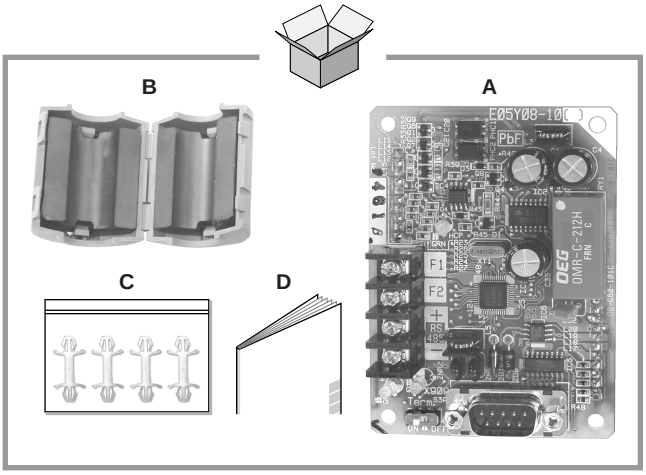
Chiller range

This specific address card is designed to function with chillers of the ranges

- EWAQ080~260DAYN****
- EWYQ080~250DAYN****

* = , , 1, 2, 3,... , 9, A, B, C,... , Z

Contents of the kit



This kit consists of:

A	Address card
B	Ferrite core
C	Plastic bag containing 4 spacers
D	Installation manual

Tools required for installation

Before you handle the address card

If handled inappropriately, your address card may suffer damage. Hold your address card by the edges. Never touch the backside of the card with your hands.

Before starting up the unit for the first time, make sure that it has been properly installed. It is therefore necessary to read the installation manual supplied with the unit and the recommendations listed in “Checks before initial start-up” carefully.

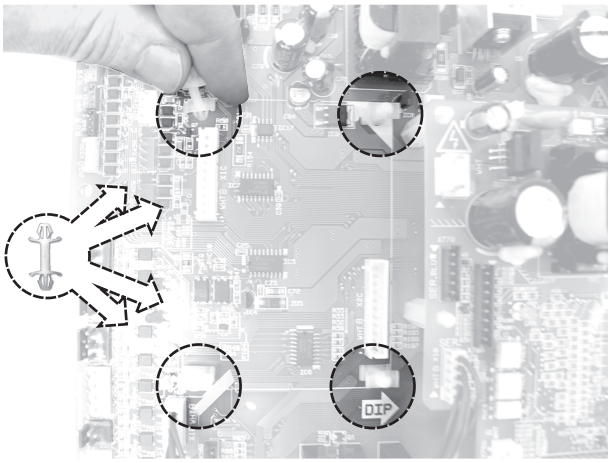
1

How to install the address card

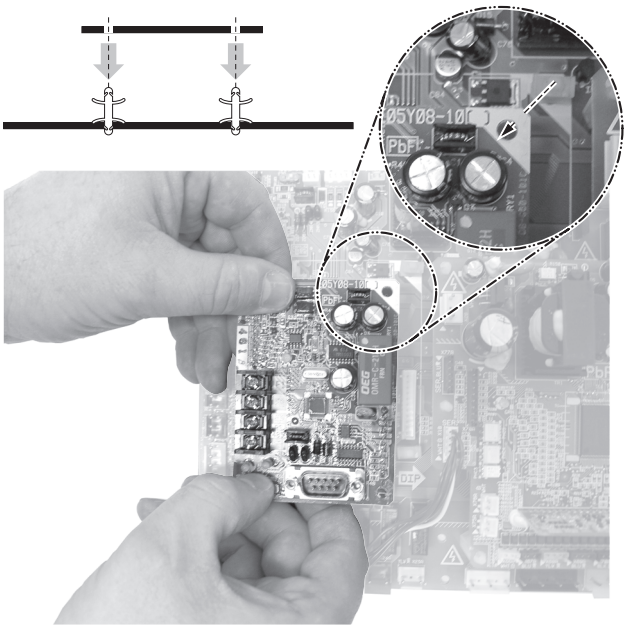
Turn the power off before installing the address card.

Installing the address card

1. Mount the 4 spacers in the holes provided for this purpose in the A11P PCB panel in the switch box as shown in the figure:



2. Install the address card as shown in the figure:

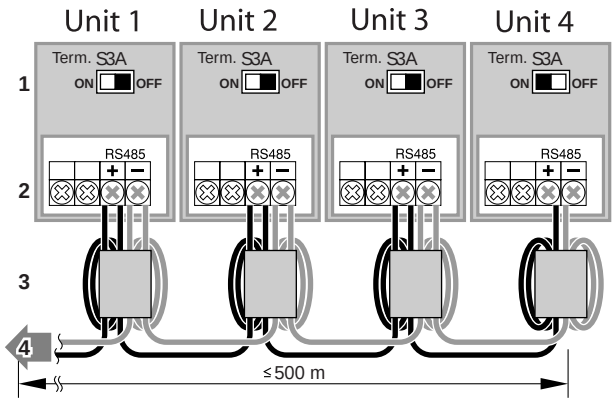


Make sure that the address card is firmly fixed. The heads of the spacers must be properly pushed through the mounting holes located at the 4 corners of the address card.

1

1.4 Connecting the address card

■ The wiring between the units must be performed as shown on the wiring diagram and as shown in the example below.

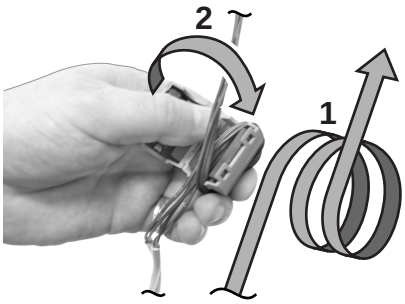


1. Setting of the S3A DIP switch on the PCB
2. Terminal on the address card (connect to + and - of RS485)
3. Ferrite core (wind the cables 2 times)
4. Up to BMS terminal

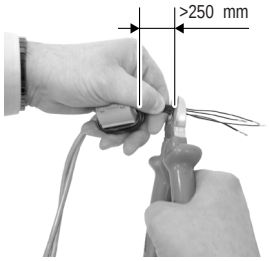
■ = DIP switch setting

■ Make the RS485 +/- connection for Modbus communication using a 0.75~1.25mm^2 2-wire cable (maximum of 500m from BMS to connection on last unit in line).

■ For each group of cables to be connected to the terminals, first wind the cables 2 times through the ferrite core (1) and then firmly close the two halves of the ferrite core (2):

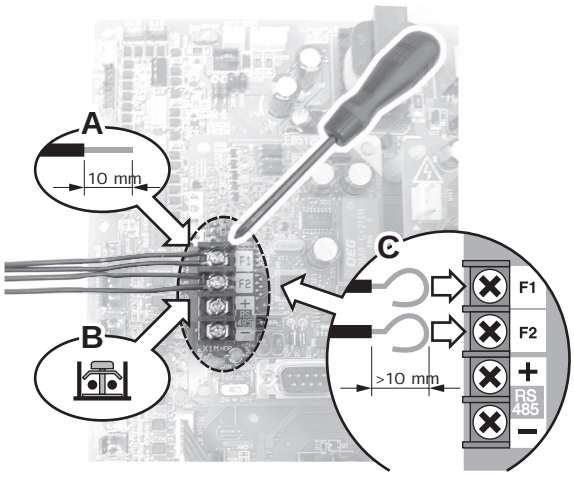


■ Cut the wiring:



■ For RS485 +/- connections on the units except the last unit in line: strip the cables (detail A) and fix them to the terminal on the address card as shown in the figure below (detail B).

■ For RS485 +/- connections on the last unit in line: strip the cables and fix them to the terminal on the address card as shown in the figure below (detail C).



General description of Modbus

The address card communicates using the Modbus protocol.

Different parts of the communication network

- The communication network consists of two major players:
  - The Building Management System (BMS) or supervisory system.
  - The chiller or multiple chillers.
- The BMS or other supervisory system is able to communicate with the chillers through the address card.
  The management of the communication occurs in accordance with a master-slave structure in polling, where the supervising BMS is the master and the address cards are the slaves.
- The chiller unit can be identified by the supervisor through the assignment of an address within the Modbus network. The address of the chiller unit can be programmed during the configuration of the BMS settings.
- The variables database of every chiller with installed address card is the point of reference for the supplier of the supervisory system in Modbus to assign a suitable meaning to the variables. The variables can be read and/or written by the supervisory system. Whether the variables are read-only or read/write depends on the connected chiller and/or the application program being used.
  - If the supervisory system assigns a value to a variable with read-only status, the command will not be executed at all.
  - Variables requested by the supervisory system that are not available in a chiller with an address card are sent from the address card to the supervisory system with zero value. The supervisory system will have to manage these properly.
  - In case the supervisory system tries to write a value of a parameter that is out of range, the writing will be ignored.

General information about the Modbus protocol

The Modicon Modbus protocol implemented in the address card complies with the content of the following document:

Modicon Modbus Protocol

Reference Guide

June 1996, PI-MBUS-300 Rev. J

The Modbus protocol implemented is of the RTU (Remote Terminal Unit) type based on character transmission times. The configuration uses the multi-drop feature of RS-485. The address sent within the Modbus packet addresses the chiller unit.

1

Implemented commands for the Modbus protocol

The implemented commands in the program are as listed:

Modbus command		Meaning	Notes
01	read coil status	Read digital variable(s)	obtains current status (ON/OFF) of a group of logic coils or discrete input
02	read input status	Read digital variable(s)	obtains current status (ON/OFF) of a group of logic coils or discrete input
03	read holding registers	Read analogue variable(s)	obtains current binary value in one or more holding registers
04	read input registers	Read analogue variable(s)	obtains current binary value in one or more holding registers
05	force single coil	Write individual digital variable(s)	forces single coil to ON or OFF status
06	preset single register	Write individual analogue variable(s)	places a specific binary value into a holding register
15	force multiple coils	Write series of digital variables	forces a series of consecutive logic coils to be defined to ON or OFF status
16	preset multiple registers	Write series of analogue variables	places specific binary values into a series of consecutive holding registers

Note that:

- Due to the variety of chillers with installed address cards, no distinction is made between input variables (with read-only status) and output variables (with read/write status) so that the knowledge of the database and its management depends on the part present on the supervisory system.
- Due to the general nature of the system, the address card answers in the same way to various Modbus commands.

Data representation of the Modbus protocol

- Digital
  All digital data is coded by a single bit:
  - ‘0’ for OFF
  - ‘1’ for ON.

  All digital variables are assigned to bits of consecutive registers, each one having:
  - the lower-address variable assigned to the less significant bit
  - the higher-address variable assigned to the most significant bit.
- Analogue and integer data
  An analogue and integer value is represented by a 16-bit WORD register in binary notation. For each register, the first byte contains the high order bits and the second byte contains the low order bits.
  - The analogue variables are represented in tenths:
  - for example, the value 10.0 is transmitted as 0064h=100d
  - for example, the value -10.0 is transmitted as FF9Ch=-100d
  - The integer variables are transferred using the effective value:
  - for example, the value 100 is transmitted as 0064h=100d

  The address card operates on registers where one register must be considered at 16-bit.

In case the BMS or supervisory system tries to write a value of a parameter that is out of range, the writing will be ignored.

Implemented error code

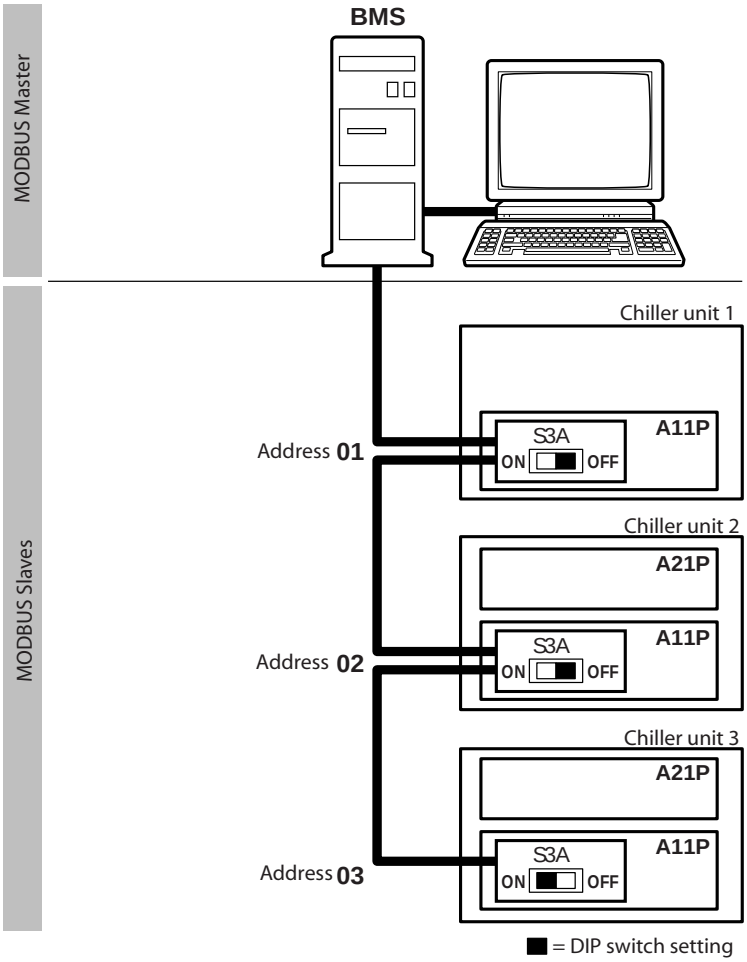
Code	Modbus interpretation	Condition
1	Illegal function	Message is not supported or the number of variables required is greater than the allowed limit (length ≤ 30)

Defining the BMS setting

Refer to the installation manual of the chiller unit for defining the BMS settings.

The cable terminal (resistor) is integrated on the address card and is enabled by means of a DIP switch (S3A).

Example:



In this example, the last in line DIP switch on the address cards of chiller units 1 and 2 are to be set to OFF. Because chiller unit 3 is the last unit in line, the last in line DIP switch on the address card must be set to ON.

Service menu: Submenu: communication

COMMUNICATION (fourth screen)

RS485	Unit 1 MODBUS	Unit 2 MODBUS	Unit 3 MODBUS	... MODBUS
ADDR: (Address)	01	02	03	...
BR: (Baudrate)	19200	19200	19200	19200
PARITY:	EVEN (1 STOPb)	EVEN (1 STOPb)	EVEN (1 STOPb)	EVEN (1 STOPb)

1

COMMUNICATION (sixth screen)

	Unit 1	Unit 2	Unit 3	...
BMS CONTROL ALLOWED:	Y	Y	Y	Y

How to operate the address card

Make sure that the address card is firmly fitted onto the A11P PCB panel, the wiring for a DICN system and/or the wiring for a MODBUS communication setup is connected properly, and that the BMS settings are correctly defined.

In the input/output status menu you can always check if the RS485 and DIII communication is active.

```
_^      COMMUNICATION
      RS232 ONLINE:N
      RS485 ONLINE:Y
       DIII ONLINE:Y
```

Variables database

The BMS or supervisory system and the chiller unit communicate through a fixed set of variables, also called address numbers. Hereafter, you will find the information you need about the digital, integer and analogue variables that the BMS or supervisory system can read from or write to the address card of the chiller.

- The register numbering and the number of coils starts with “1” in decimal notation.
- The register address numbering and coil address numbering starts with “00” in hexadecimal notation.

Digital variables

Register number (decimal)	Register address (hexadecimal)	Coil number (decimal)	Coil address (hexadecimal)	Read/ Write	Description	Comment
1	00	1	00	—	—	Not used
4	03	49	30	R	Unit status: monitoring	0= Off, 1= On
		50	31	W	Unit status: control	0= Off, 1= On
		51	32	R	General alarm	0= no alarm, 1= alarm
		52	33	R	Thermostat status	0= Off, 1= On
		53	34	R	Low noise status (only for OPIF)	0= no, 1= yes
		54	35	R	Low pressure bypass active C1	0= no, 1= yes
		55	36	R	Low pressure bypass active C2	0= no, 1= yes
		63	3E	R	Free cooling active	0= no, 1= yes
		64	3F	R	Remote on/off enabled	0= no, 1= yes ("yes" if "REMOTE ON/OFF" is selected on a changeable digital input)
7	06	97	60	R	Reverse phase detection (L1-L2-L3) circuit 1	0= OK, 1= not OK [X12A (1-3-5)]
		98	61	R	Digital input: High pressure switch circuit 1	0= Open, 1= closed [X4A]
		99	62	R	Digital input: Compressor interlock 1 circuit 1	0= Open, 1= closed [X5A]
		100	63	R	Digital input: Compressor interlock 2 circuit 1	0= Open, 1= closed [X6A]
		101	64	R	Digital input: Fan overcurrent relay Fanstep 1 circuit 1	0= Open, 1= closed [X7A]
		102	65	R	Digital input: Fan overcurrent relay Fanstep 2 circuit 1	0= Open, 1= closed [X8A]
		103	66	R	Digital input: Fan overcurrent relay Fanstep 3 circuit 1	0= Open, 1= closed [X9A]
		107	6A	R	Digital input: Fan inverter safety circuit 1 (only for OPIF)	0= Open, 1= closed [X27A]
		111	6E	R	Digital input: Flow switch	0= Open, 1= closed [X30A]
		112	6F	R	Digital input: Pump interlock	0= Open, 1= closed [X31A]
8	07	113	70	R	Changeable digital input1: function not pre-defined (default)	0= Open, 1= closed [X32A (3-4)]
		114	71	R	Changeable digital input2: function not pre-defined (default)	0= Open, 1= closed [X32A (1-2)]
		115	72	R	Digital output: Compressor contactor 1 circuit 1	0= Open, 1= closed [X13A]
		116	74	R	Digital output: Compressor contactor 2 circuit 1	0= Open, 1= closed [X14A]
		117	74	R	Digital output: Heatertape	0= Open, 1= closed [X15A]
		118	75	R	Digital output: Pump contactor	0= Open, 1= closed [X16A]
		119	76	R	Digital output: Reverse valve circuit 1 (Only for EWYQ)	0= Open, 1= closed [X17A]
		121	78	R	Digital output: Fanstep 1 circuit 1	0= Open, 1= closed [X19A (1-3)]
		122	79	R	Digital output: Fanstep 2 circuit 1	0= Open, 1= closed [X19A (5-7)]
		123	7A	R	Digital output: Fanstep 3 circuit 1	0= Open, 1= closed [X20A]
		126	7D	R	Changeable digital output1: "SAFETY+W. (NO)" (default)	0= Open, 1= closed [X22A]
		128	7F	R	Changeable digital output2: "GEN. OPERATION" (default)	0= Open, 1= closed [X24A]
9	08	129	80	R	Changeable digital output3: function not pre-defined (default)	0= Open, 1= closed [X25A]
		130	81	R	Changeable digital input3: function not pre-defined (default)	0= Open, 1= closed [X65A] (1-2)
		131	82	R	Changeable digital input4: function not pre-defined (default)	0= Open, 1= closed [X65A] (3-4)
		136	87	R	Changeable digital output6: function not pre-defined (default)	0= Open, 1= closed [X63A]
		137	88	R	Changeable digital output4: function not pre-defined (default)	0= Open, 1= closed [X64A] (1-3)
		138	89	R	Changeable digital output5: function not pre-defined (default)	0= Open, 1= closed [X64A] (5-7)
10	09	145	90	R	Reverse phase detection (L1-L2-L3) circuit 2	0= OK, 1= not OK [X12A (1-3-5)]
		146	91	R	Digital input: High pressure switch circuit 2	0= Open, 1= closed [X4A]
		147	92	R	Digital input: Compressor interlock 1 circuit 2	0= Open, 1= closed [X5A]
		148	93	R	Digital input: Compressor interlock 2 circuit 2	0= Open, 1= closed [X6A]
		149	94	R	Digital input: Fan overcurrent relay Fanstep 1 circuit 2	0= Open, 1= closed [X7A]
		150	95	R	Digital input: Fan overcurrent relay Fanstep 2 circuit 2	0= Open, 1= closed [X8A]
		151	96	R	Digital input: Fan overcurrent relay Fanstep 3 circuit 2	0= Open, 1= closed [X9A]
		155	9A	R	Digital input: Fan inverter safety circuit 2 (only for OPIF)	0= Open, 1= closed [X27A]

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Register number (decimal)	Register address (hexadecimal)	Coil number (decimal)	Coil address (hexadecimal)	Read/ Write	Description	Comment
11	0A	163	A2	R	Digital output: Compressor contactor 1 circuit 2	0= Open, 1= closed [X13A]
		164	A3	R	Digital output: Compressor contactor 2 circuit 2	0= Open, 1= closed [X14A]
		167	A6	R	Digital output: Reverse valve circuit 2 (only for EWYQ)	0= Open, 1= closed [X17A]
		169	A8	R	Digital output: Fanstep 1 circuit 2	0= Open, 1= closed [X19A (1-3)]
		170	A9	R	Digital output: Fanstep 2 circuit 2	0= Open, 1= closed [X19A (5-7)]
		171	AA	R	Digital output: Fanstep 3 circuit 2	0= Open, 1= closed [X20A]

Analogue and integer variables

Address (decimal)	Register address (hexadecimal)	Read/ Write	Description	Unit of measurement	Comment
18	11	R/W	Active Cooling inlet setpoint	°°C x1/10	Depends on changeable digital input: Dual setpoint
19	12	R/W	Active Cooling outlet setpoint	°°C x1/10	Depends on changeable digital input: Dual setpoint
21	14	R/W	Active Heating inlet setpoint (only EWYQ)	°°C x1/10	Depends on changeable digital input: Dual setpoint
22	15	R/W	Active Heating outlet setpoint (only EWYQ)	°°C x1/10	Depends on changeable digital input: Dual setpoint
23	16	R/W	Cooling inlet setpoint 1	°°C x1/10	—
24	17	R/W	Cooling inlet setpoint 2	°°C x1/10	—
25	18	R/W	Cooling outlet setpoint 1	°°C x1/10	—
26	19	R/W	Cooling outlet setpoint 2	°°C x1/10	—
29	1C	R/W	Heating inlet setpoint 1 (only EWYQ)	°°C x1/10	—
30	1D	R/W	Heating inlet setpoint 2 (only EWYQ)	°°C x1/10	—
31	1E	R/W	Heating outlet setpoint 1 (only EWYQ)	°°C x1/10	—
32	1F	R/W	Heating outlet setpoint 2 (only EWYQ)	°°C x1/10	—
35	22	R/W	Thermostat A	°°C x1/10	—
36	23	R/W	Thermostat B	°°C x1/10	—
37	24	R/W	Thermostat C	°°C x1/10	—
39	26	R	Minimum Outlet Water	°°C x1/10	—
40	27	R	High Pressure Circuit 1 Temperature	°°C x1/10	—
41	28	R	Low Pressure Circuit 1 Temperature	°°C x1/10	—
42	29	R	High Pressure Circuit 2 Temperature	°°C x1/10	—
43	2A	R	Low Pressure Circuit 2 Temperature	°°C x1/10	—
82	51	R	Analogue input: Ambient sensor	°°C x1/10	[X33A]
83	52	R	Analogue input: Inlet water sensor	°°C x1/10	[X34A]
84	53	R	Analogue input: Outlet water sensor	°°C x1/10	[X35A]
85	54	R	Analogue input: Suction temperature sensor circuit 1	°°C x1/10	[X36A]
86	55	R	Analogue input: Refrigerant piping temperature sensor circuit 1	°°C x1/10	[X37A]
87	56	R	Analogue input: Coil temperature sensor 1 circuit 1 (only for EWYQ)	°°C x1/10	[X38A]
88	57	R	Analogue input: Coil temperature sensor 2 circuit 1 (only for EWYQ)	°°C x1/10	[X39A]
89	58	R	Analogue input: Discharge temperature sensor 1 circuit 1	°°C x1/10	[X40A]
90	59	R	Analogue input: Discharge temperature sensor 2 circuit 1	°°C x1/10	[X41A]
91	5A	R	Analogue input: High pressure sensor circuit 1	bar x1/10	[X42A]
92	5B	R	Analogue input: Low pressure sensor circuit 1	bar x1/10	[X43A]
93	5C	R	Analogue input: Current measurement (only for OP57)	A x1/10	[X44A]
94	5D	R	Analogue input: Voltage measurement (only for OP57)	V x1/10	[X45A]
96	5F	R	Analogue input: Heating suction temperature sensor 1 circuit 1 (only for EWYQ)	°°C x1/10	[X66A]
98	61	R	Analogue input: Heating suction temperature sensor 2 circuit 1 (only for EWYQ)	°°C x1/10	[X67A]
99	62	R	Changeable analogue input2: function not pre-defined (default)	(V or mA or °°C x1/10) or DI	In case type= DI then 0= Open, 50= Closed [X68A]
100	63	R	Changeable analogue input1: function not pre-defined (default)	(V or mA or °°C x1/10) or DI	In case type= DI then 0= Open, 50= Closed [X69A]
101	64	R	Changeable analogue input4: function not pre-defined (default)	(V or mA or °°C x1/10) or DI	In case type= DI then 0= Open, 50= Closed [X70A]
102	65	R	Changeable analogue input3: function not pre-defined (default)	(V or mA or °°C x1/10) or DI	In case type= DI then 0= Open, 50= Closed [X71A]

Address (decimal)	Register address (hexadecimal)	Read/ Write	Description	Unit of measurement	Comment
103	66	R	Analogue output: Fanspeed signal circuit 1 (only for OPIF)	V x1/10	[X72A (3-4)]
105	68	R	Changeable analogue input1: function not pre-defined (default)	V or mA x1/10	[X73A]
106	69	R	Analogue output: Fanspeed signal circuit 2 (only for OPIF)	V x1/10	[X74A (4-5)]
131	82	R	Analogue input: Heating suction temperature sensor 1 circuit 2 (only for EWYQ)	°°C x1/10	[X34A]
132	83	R	Analogue input: Heating suction temperature sensor 2 circuit 2 (only for EWYQ)	°°C x1/10	[X35A]
133	84	R	Analogue input: Suction temperature sensor circuit 2	°°C x1/10	[X36A]
134	85	R	Analogue input: Refrigerant piping temperature sensor circuit 2	°°C x1/10	[X37A]
135	86	R	Analogue input: Coil temperature sensor 1 circuit 2 (only for EWYQ)	°°C x1/10	[X38A]
136	87	R	Analogue input: Coil temperature sensor 2 circuit 2 (only for EWYQ)	°°C x1/10	[X39A]
137	88	R	Analogue input: Discharge temperature sensor 1 circuit 2	°°C x1/10	[X40A]
138	89	R	Analogue input: Discharge temperature sensor 2 circuit 2	°°C x1/10	[X41A]
139	8A	R	Analogue input: High pressure sensor c2	bar x1/10	[X42A]
140	8B	R	Analogue input: Low pressure sensor c2	bar x1/10	[X43A]
178	B1	R	Error Code (of highest priority active error)	—	0= no safety 1=… (refer to "Overview integer values of safety codes @difference between softcopy input files (installation manual) and print-out@" on page 17)
179	B2	R	Error Code (of highest priority active error)	—	0= unit, 1= circuit 1, 2= circuit 2, 5= network, 6= warning
180	B3	R	Error Code (of selected active error) refer to integer parameter 182	—	0= no safety 1=… (refer to "Overview integer values of safety codes @difference between softcopy input files (installation manual) and print-out@" on page 17)
181	B4	R	Error Type (of selected active error) refer to integer parameter 182	—	0= unit, 1= circuit 1, 2= circuit 2, 5= network, 6= warning
182	B5	R/W	Selected active error number	—	The information of the active error corresponding to this reference number is displayed in variables 180 and 181 (the maximum allowed input = value of variable 183)
183	B6	R	Maximum number of active errors that are present	—	—
184	B7	R/W	Cooling/Heating mode setting Remark: R only in case remote cool/heat by digital input is selected in software	—	0= COOLING, 1= HEATING
185	B8	R/W	Thermostat mode	—	0= MANUAL CONTROL, 1= INL WATER, 2= OUTL WATER
186	B9	R	Active mode	—	0= MANUAL MODE, 1= INLSETP1, 2= INLSETP2, 3= OUTSETP1, 4= OUTSETP2
187	BA	R	Unit capacity	%	—
188	BB	R	Capacity C1	%	—
189	BC	R	Capacity C2	%	—
192	BF	R	Unit current (only for OP57)	A	—
199	C6	R/W	Capacity limit mode	—	0= NOT ACTIVE, 1= CHANG.DIG.INP, 2= LIMIT 25%, 50%, 75% or SETTING (refer to next variable)
200	C7	R/W	Capacity limit mode selection	—	Only valid in case address 199 is equal to "2" 0= LIMIT 25%, 1= LIMIT 50%, 2= LIMIT 75%, 3= LIMIT SETTING
201	C8	R/W	Capacity Limitation Setting for C11	—	0= OFF, 1= ON
202	C9	R/W	Capacity Limitation Setting for C12	—	0= OFF, 1= ON
203	CA	R/W	Capacity Limitation Setting for C21	—	0= OFF, 1= ON
204	CB	R/W	Capacity Limitation Setting for C22	—	0= OFF, 1= ON
205	CC	R/W	Low noise mode	—	0= NOT ACTIVE, 1= CHANG.DIG.INP, 2= DAILY SCHEDULE, 3= ACTIVE

1

Address (decimal)	Register address (hexadecimal)	Read/ Write	Description	Unit of measurement	Comment
206	CD	R	Status of C11	—	1= CAN STARTUP, 2= NO PRIORITY, 3= NO FLOW, 4= PUMPLEAD TIM, 5= TIMER BUSY, 6= FREE COOLING, 7= AREC INLET, 8= UNIT OFF, 9= STANDBY DICN, 10= LIMIT, 11= MIN.RUN.TIM, 12= HP SETBACK, in case of software V1.0: 13= DEFROST BUSY, 14= FREEZEUP PR, 15= FREEZEUP DIS, 16= SAFETY ACT. in case of software V2.0 and above: 13= COMP PR, 14= DEFROST BUSY, 15= FREEZEUP PR, 16= FREEZEUP DIS, 17= SAFETY ACT.
207	CE	R	Status of C12		
208	CF	R	Status of C21		
210	D1	R	Status of C22		
211	D2	R	RH11 (compressor 11 running hours) higher part	h x 1000	Running hours= higher part x 1000 + lower part
212	D3	R	RH11 (compressor 11 running hours) lower part	h	
213	D4	R	RH12 (compressor 12 running hours) higher part	h x 1000	
214	D5	R	RH12 (compressor 12 running hours) lower part	h	
215	D6	R	RH21 (compressor 21 running hours) higher part	h x 1000	
216	D7	R	RH21 (compressor 21 running hours) lower part	h	
217	D8	R	RH22 (compressor 22 running hours) higher part	h x 1000	
218	D9	R	RH22 (compressor 22 running hours) lower part	h	
219	DA	R	C11C (compressor 11 cooling hours) higher part (only for EWYQ)	h x 1000	Running hours= higher part x 1000 + lower part
220	DB	R	C11C (compressor 11 cooling hours) lower part (only for EWYQ)	h	
221	DC	R	C12C (compressor 12 cooling hours) higher part (only for EWYQ)	h x 1000	
222	DD	R	C12C (compressor 12 cooling hours) lower part (only for EWYQ)	h	
223	DE	R	C21C (compressor 21 cooling hours) higher part (only for EWYQ)	h x 1000	
224	DF	R	C21C (compressor 21 cooling hours) lower part (only for EWYQ)	h	
226	E1	R	C22C (compressor 22 cooling hours) higher part (only for EWYQ)	h x 1000	
227	E2	R	C22C (compressor 22 cooling hours) lower part (only for EWYQ)	h	
228	E3	R	C11H (compressor 11 heating hours) higher part (only for EWYQ)	h x 1000	Running hours= higher part x 1000 + lower part
229	E4	R	C11H (compressor 11 heating hours) lower part (only for EWYQ)	h	
230	E5	R	C12H (compressor 12 heating hours) higher part (only for EWYQ)	h x 1000	
231	E6	R	C12H (compressor 12 heating hours) lower part (only for EWYQ)	h	
232	E7	R	C21H (compressor 21 heating hours) higher part (only for EWYQ)	h x 1000	
233	E8	R	C21H (compressor 21 heating hours) lower part (only for EWYQ)	h	
234	E9	R	C22H (compressor 22 heating hours) higher part (only for EWYQ)	h x 1000	
235	EA	R	C22H (compressor 22 heating hours) lower part (only for EWYQ)	h	
236	EB	R	CS11 (number of compressor 11 startups) higher part	—	Number of compressor startups= higher part x 1000 + lower part
237	EC	R	CS11 (number of compressor 11 startups) lower part	—	
238	ED	R	CS12 (number of compressor 12 startups) higher part	—	
239	EE	R	CS12 (number of compressor 12 startups) lower part	—	
242	F1	R	CS21 (number of compressor 21 startups) higher part	—	
243	F2	R	CS21 (number of compressor 21 startups) lower part	—	
244	F3	R	CS22 (number of compressor 22 startups) higher part	—	
245	F4	R	CS22 (number of compressor 22 startups) lower part	—	

Address (decimal)	Register address (hexadecimal)	Read/ Write	Description	Unit of measurement	Comment
246	F5	R	Actual status fan circuit 1	—	0= Off, 1= LLLL, 2= LLL, 3= LL, 4= Low, 5= Medium, 6= High
			Actual status fan circuit 1 (OPIF)	%	0~100
247	F6	R	Actual status fan circuit 2	—	0= Off, 1= LLLL, 2= LLL, 3= LL, 4= Low, 5= Medium, 6= High
			Actual status fan circuit 2 (OPIF)	%	0~100
250	F9	R/W	Loadup time inlet control	s	—
251	FA	R/W	Loaddown time inlet control	s	—
252	FB	R/W	Loadup time outlet control	s	—
253	FC	R/W	Loaddown time outlet control	s	—
254	FD	R	BMS allowed	—	0= No, 1= Yes
255	FE	R	Software version high	—	Version= Software version high.Software version low
256	FF	R	Software version low	—	
258	101	R	SoftCode Main PCB	—	xxxx value => SPxxxxy zzz (e.g. SP1532A 036)
259	102	R	SoftCode Extension 1 PCB	—	xxxx value => SPxxxxy zzz (e.g. SP1559A 009)
260	103	R	SoftCode Remocon	—	xxxx value => SPxxxxy zzz (e.g. SP1534A 028)
261	104	R	SoftCode Main PCB character	—	y value (0=" ", 1="A", 2="B" …) => SPxxxxy zzz
262	105	R	SoftCode Extension PCB character	—	y value (0=" ", 1="A", 2="B" …) => SPxxxxy zzz
263	106	R	SoftCode Remocon character	—	y value (0=" ", 1="A", 2="B" …) => SPxxxxy zzz
264	107	R	SoftVersion Main PCB	—	zzz value => SPxxxxy zzz
265	108	R	SoftVersion Extension PCB	—	zzz value => SPxxxxy zzz
266	109	R	SoftVersion Remocon PCB	—	zzz value => SPxxxxy zzz
267	10A	R	Unittype 1	—	0= AW
268	10B	R	Unittype 2	—	0= CO, 1= RH
269	10C	R	Unittype 3	kW	0~999
270	10D	R	Number of circuits	—	1, 2
271	10E	R	Number of evaporators	—	1
272	10F	R	Number of coils	—	1, 2
274	111	R	Refrigerant	—	0= R410A
275	112	R	Compressor type	—	0= SCL
276	113	R	EEV Type	—	0= "P"
277	114	R	VA option (OP57)	—	0= No, 1= Yes
278	115	R	Fan option (OPIF)	—	0= No, 1= Yes
279	116	R	Dual-pump option (OPTP or OPTC)	—	0= No, 1= Yes
280	117	R	Evaporator option (OP10)	—	0= No, 1= Yes
281	118	R/W	Number of slaves (only for DICN + Master)	—	—
282	119	R	Master or slave (only for DICN)	—	0= Master, 1= Slave1, 2= Slave2, 3= Slave3
283	11A	R/W	Mode (only for DICN)	—	0= Normal, 1= standby, 2= disconnect on/off
284	11B	R	Status of master (only for DICN)	—	0= Normal, 1= standby, 2= disconnect on/off, 3= safety
285	11C	R	Status of S1 (only for DICN)	—	0= Normal, 1= standby, 2= disconnect on/off, 3= safety
286	11D	R	Status of S2 (only for DICN)	—	0= Normal, 1= standby, 2= disconnect on/off, 3= safety
287	11E	R	Status of S3 (only for DICN)	—	0= Normal, 1= standby, 2= disconnect on/off, 3= safety

Overview integer values of safety codes @difference between softcopy input files (installation manual) and print-out@

Value		Message safety menu
0	UNIT SAFETY	No safety
1	UNIT SAFETY	"0F0:EMERGENCY STOP"
2	UNIT SAFETY	"0AE:FLOW HAS STOPPED"
4	UNIT SAFETY	"0C9:INL SENSOR ERR"
5	UNIT SAFETY	"0CA:OUT SENSOR ERR"
6	UNIT SAFETY	"0H9:AMB T SENSOR ERR"
9	UNIT SAFETY	"0U4:EXT PCB COMM.ERR"
10	UNIT SAFETY	"0U4:MAINPCB COMM.ERR"
12	UNIT SAFETY	"0AE:PUMPINTERLOCK"
14	UNIT WARNING	"0AE:FLOW HAS STOPPED"
16	UNIT WARNING	"0C9:INL SENSOR ERR"
17	UNIT SAFETY	"0A9:EEV PCB COMM ERR"
18	UNIT SAFETY	"0A9:EEV PCB ERR"

Value		Message safety menu
62	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH1"
63	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH2"
64	UNIT WARNING	"1J6:COIL1 SENSOR ERR"
65	UNIT WARNING	"1J7:COIL2 SENSOR ERR"
66	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
67	UNIT SAFETY	"0A4:FREEZE UP C1"
70	CIRCUIT 2 SAFETY	"1U1:REV PHASE PROT"
71	CIRCUIT 2 SAFETY	"1E3:HIGH PRESSURE SW"
75	CIRCUIT 2 SAFETY	"1E4:LOW PRESSURE"
77	CIRCUIT 2 SAFETY	"1JA:HP SENSOR ERR"
78	CIRCUIT 2 SAFETY	"1JC:LP SENSOR ERR"
82	CIRCUIT 2 SAFETY	"153:FAN INV ERR."
84	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR1"

1

Value		Message safety menu
19	UNIT SAFETY	"0UA:OP.NOT CONFIRMED"
29	UNIT SAFETY	"0U5:PCB COMM.PROBLEM"
30	CIRCUIT 1 SAFETY	"1U1:REV PHASE PROT"
31	CIRCUIT 1 SAFETY	"1E3:HIGH PRESSURE SW"
35	CIRCUIT 1 SAFETY	"1E4:LOW PRESSURE"
37	CIRCUIT 1 SAFETY	"1JA:HP SENSOR ERR"
38	CIRCUIT 1 SAFETY	"1JC:LP SENSOR ERR"
42	CIRCUIT 1 SAFETY	"153:FAN INV ERR."
44	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR1"
45	CIRCUIT 1 SAFETY	"1F3:HIGH DISCH TEMP1"
46	UNIT WARNING	"153:FAN OVERC. ST1"
47	UNIT WARNING	"153:FAN OVERC. ST2"
48	UNIT WARNING	"153:FAN OVERC. ST3"
49	CIRCUIT 1 SAFETY	"1A9:EEV ERR"
50	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST1"
51	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST2"
52	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST3"
53	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERR"
54	CIRCUIT 1 SAFETY	"1A9:SUPERHEAT ERR"
56	UNIT WARNING	"1E3:HP SETBACK"
57	UNIT WARNING	"1E6:COMP PR"
58	CIRCUIT 1 SAFETY	"1E6:COMPR 1 SAFETY"
59	CIRCUIT 1 SAFETY	"1E6:COMPR 2 SAFETY"
60	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR2"
61	CIRCUIT 1 SAFETY	"1F3:HIGH DISCH TEMP2"

Value		Message safety menu
85	CIRCUIT 2 SAFETY	"1F3:HIGH DISCH TEMP1"
86	UNIT WARNING	"253:FAN OVERC. ST1"
87	UNIT WARNING	"253:FAN OVERC. ST2"
88	UNIT WARNING	"253:FAN OVERC. ST3"
89	CIRCUIT 2 SAFETY	"1A9:EEV ERR"
90	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST1"
91	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST2"
92	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST3"
93	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERR"
94	CIRCUIT 2 SAFETY	"1A9:SUPERHEAT ERR"
96	UNIT WARNING	"2E3:HP SETBACK"
97	UNIT WARNING	"2E6:COMP PR"
98	CIRCUIT 2 SAFETY	"1E6:COMPR 1 SAFETY"
99	CIRCUIT 2 SAFETY	"1E6:COMPR 2 SAFETY"
100	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR2"
101	CIRCUIT 2 SAFETY	"1F3:HIGH DISCH TEMP2"
102	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH1"
103	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH2"
104	UNIT WARNING	"2J6:COIL1 SENSOR ERR"
105	UNIT WARNING	"2J7:COIL2 SENSOR ERR"
106	CIRCUIT 2 SAFETY	"1J5:REFR SENSOR ERR"
107	UNIT SAFETY	"0A4:FREEZE UP C2"
190	NETWORK SAFETY	"0U4:PCB COMM.PROBLEM"
191	NETWORK SAFETY	"0CA:OUT E SENSOR ERR"
192	NETWORK SAFETY	"0C9:INL E SENSOR ERR"
194	NETWORK SAFETY	"0U4:SW VERSION ERR"

Part 2
LON

Overview

This part contains the following chapters:

Chapter	See page
1 Design guide	2–3
2 Functional specifications	2–17
3 Gateway configuration	2–19
4 Communication procedure	2–31
5 LON objects	2–39
6 History	2–43
7 Configuration files	2–45

1 Design guide

1.1 What Is in This Chapter?

Overview

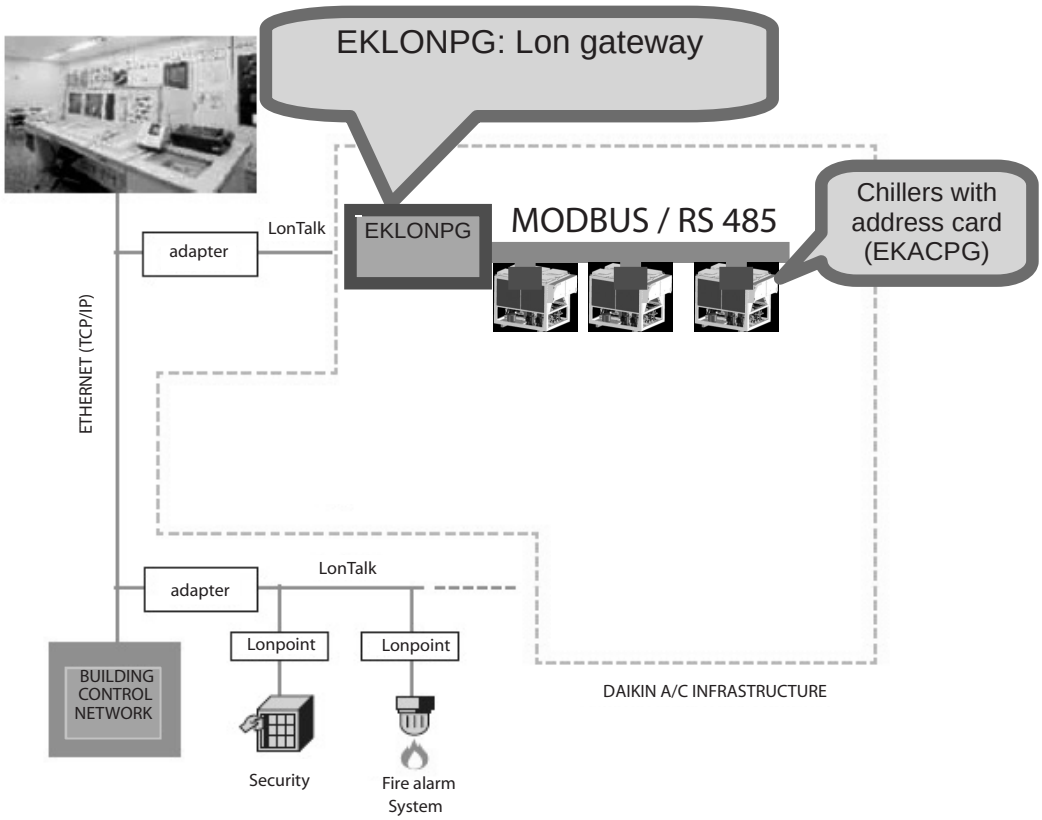
This chapter contains the following topics:

Topic	See page
1.2 Outline and features	2–4
1.3 System outline	2–5
1.4 System configuration	2–6
1.5 Specifications	2–7
1.6 LON objects	2–11
1.7 Function	2–15
1.8 Wiring diagram	2–16

1.2 Outline and features

1. Manage the information of up till 8 multiscroll chillers.
2. Compatible with LonWorks® Network.

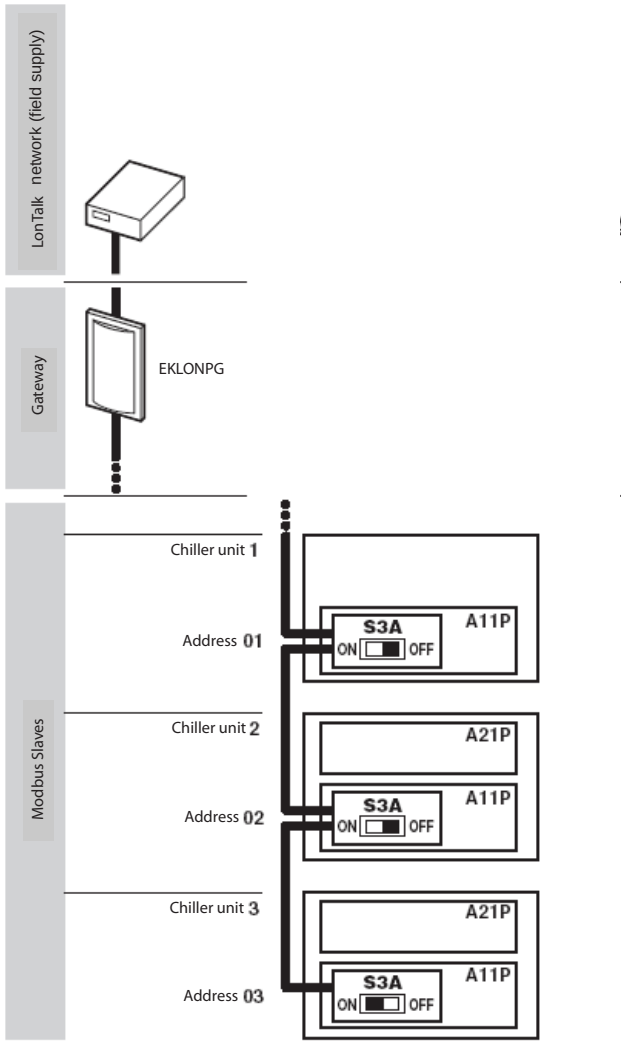
1.3 System outline



Address card	EKACPG	Kit for serial connection on multiscroll chiller

1.4 System configuration

Examples of communication connections

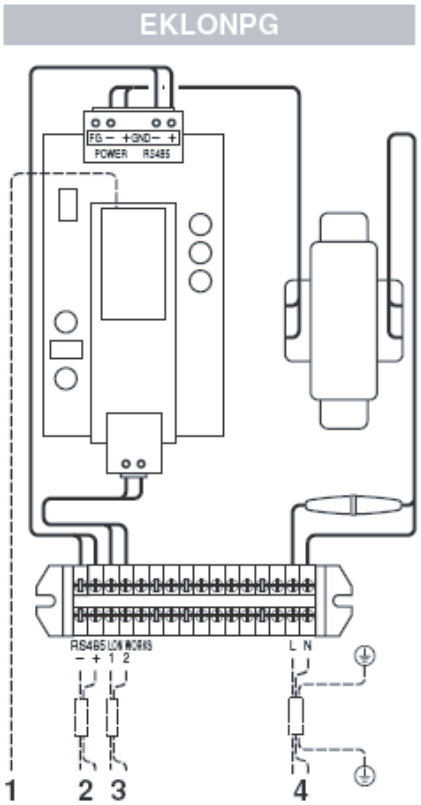


Maximum 8 multiscroll chillers.

1.5 Specifications

LonWorks® networks compatible gateway	8 multiscroll chillers per gateway
Protocol	LonTalk®
Transmission speed	78 kbps
Topology	FTT-10A Free topology
Transmission medium	Twisted pair wire
Power supply	1~, 230 VAC, +-10% at 50/60Hz
Relative Humidity	5-90%, non-condensing
Operation temperature	-15~60°C
Storage temperature	-20~70°C
Dimensions (HxWxD)	357 x 240 x 78 mm
Power consumption	Max. 5 W
Weight	2.1 kg

Components



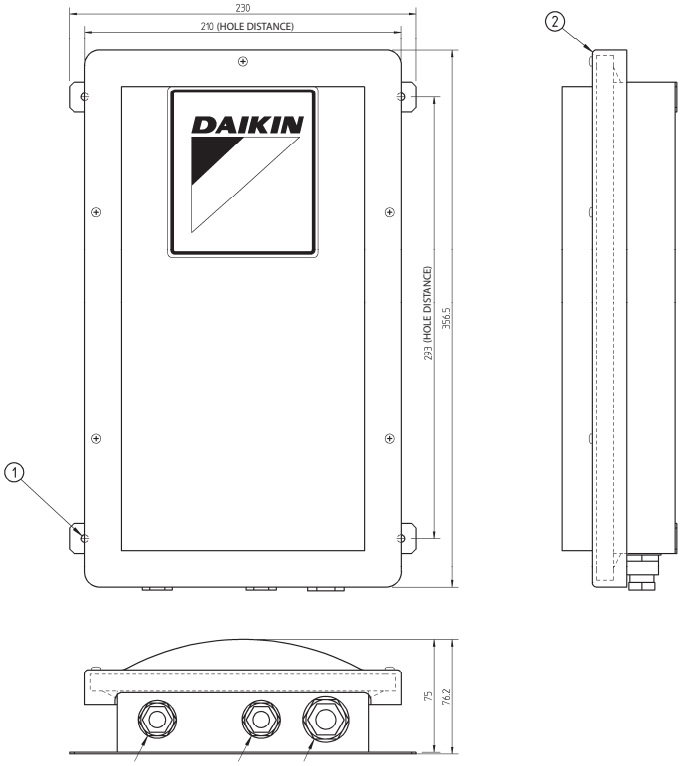
1. Ethernet 10/100 Base-T connection for PC configuration
2. RS485 Modbus connection
3. LonWorks® connection
4. Power supply

2

Accessories

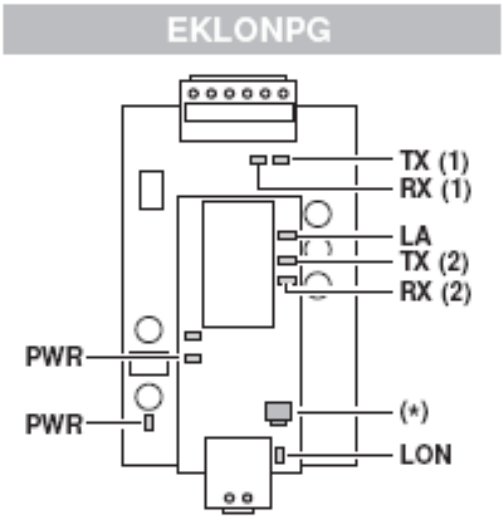
For EKLONPG : Lon Gateway option box	1x	Screw nut	3x
		Manual	1x

Dimensions



1. 4x hole ∅5 to fix the option box
2. Option box lid

Operation and display signals



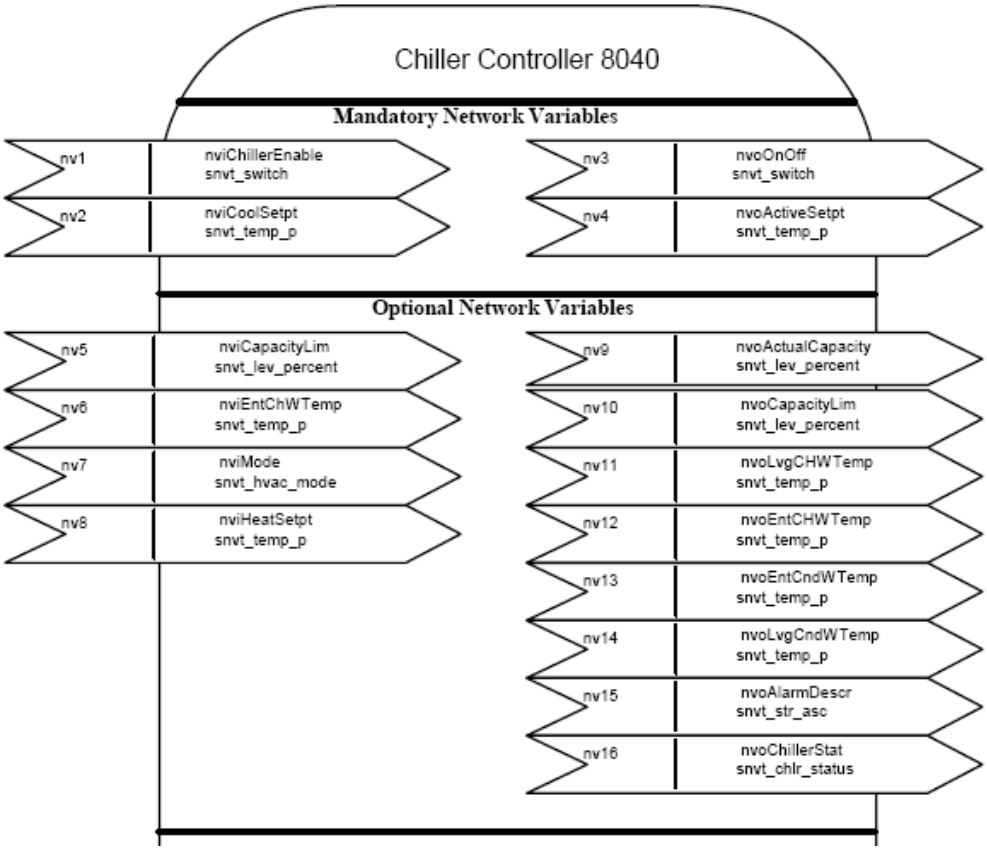
LED	Colour	
PWR (2x)	green	Lights up when power is connected
RX (1)	green	Flashes when receiving data via RS485 Modbus
TX (1)	green	Flashes when transmitting data via RS485 Modbus
only for **Lon Gateway (EKLONPG)**		
LA	green	Flashes when the PCB is in normal operation
LON	red	Lights up when the Lon service pin (*) is pushed
RX (2)	green	Flashes when receiving data via LonTalk® network
TX (2)	green	Flashes when transmitting data via LonTalk® network

(*) Lon service pin: The network integrator will need to push the Lon service pin during commissioning the LonTalk® network.

1.6 LON objects

The LON objects are based on the Lonmark function profile 8040. Following items are taken into account with the multiscroll chillers setup.

1. The variables are extended with _XXX to determine the chiller unit (_001= first chiller unit,...).
2. Some variables are not integrated: **nviEntCndWTemp**,...
3. The valid range of all the variables is adapted to the multiscroll chillers.
4. The variable nvoAlarmDescr: “The SNVT type “SNVT_str_asc” according to chiller profile 8040 is replaced by “SNVT_Count”.



LON (based on profile Chiller 8040 but extended with xxx)									
NV #	Name xxx=Chiller nr	Reference name according to Chiller profile 8040	In/ Out	SNVT Type (SNVT Index)	Class	Description (according to Chiller profile 8040)	Valid range		Additional explanation
1	nviChlrEnbl_xxx	nviChillerEnable	In	SNVT_switch	ram	Request Start/ Stop Chiller	0 or 1	0 = Request Chiller Off 1 = Request Chiller On	Control on/off state by pushing on/off button (After turning the LON gateway On, the default value is “0”)
2	nviCoolSetpt_xxx	nviCoolSetpt	In	SNVT_temp_p	ram	Desired Temp of Lvg Chilled Wtr	°C range depending on unit type		Control cooling setpoint (inlet/outlet depending on thermostat mode) (After turning the LON gateway On, the default value is “0”)

LON (based on profile Chiller 8040 but extended with xxx)									
3	nvoOnOff_xxx	nvoOnOff	Out	SNVT_switch	ram	Chiller On / Off run state	0 or 1	0 = Chiller Off 1 = Chiller On	Read-out status of on/off LED
4	nvoActvSetpt_xxx	nvoActiveSetpt	Out	SNVT_temp_p	ram	Active Cool or Heat Setpt	°C range depending on unit type		Read-out active setpoint (Cooling/heating/inlet/outlet depending active thermostat mode)
5	nviCapctyLim_xxx	nviCapacityLim	In	SNVT_lev_percent	ram	Capacity Limit of Chiller	For units with 1 circ: 0% or 50% or 100% For units with 2 circ: 0% or 25% or 50% or 75% or 100%		Control capacity limitation (After turning the LON gateway On, the default value is “0”)
6	-	nviEntChwTemp	In	SNVT_temp_p	ram	Accommodates Remote Temp Sensor input			Not integrated
7	nviMode_xxx	nviMode	In	SNVT_Hvac_mode	ram	Chiller Mode s	SNVT_hvac_mode	HVAC_HEAT : 1 = Heating HVAC_COOL : 3 = Cooling	Control cooling-heating mode (After turning the LON gateway On, the default value is “0”)
8	nviHeatSetpt_xxx	nviHeatSetpt	In	SNVT_temp_p	ram	Heating Setpoint	°C range depending on unit type		Control heating setpoint (inlet/outlet depending on thermostat mode) (After turning the LON gateway On, the default value is “0”)
9	nvoActCapcty_xxx	nvoActualCapacity	Out	SNVT_lev_percent	ram	Actual Running Capacity of Unit	range 0% or 25% or 50% or 75% or 100%		Read-out capacity of unit
10	nvoCapctyLim_xxx	nvoCapacityLim	Out	SNVT_lev_percent	ram	Current Capacity Limit Setting of Chiller	range 0% or 25% or 50% or 75% or 100%		Read-out capacity limitation setting of unit
11	nvoLvgChwTmp_xxx	nvoLvgChwTemp	Out	SNVT_temp_p	ram	Leaving Chilled Water Temp	°C range depending on unit type		Read-out Outlet water temp
12	nvoEntChwTmp_xxx	nvoEntChwTemp	Out	SNVT_temp_p	ram	Entering Chilled Water Temp	°C range depending on unit type		Read-out Inlet water temp
13	-	nvoEntCndWTemp	Out	SNVT_temp_p	ram	Entering Condenser Water Temp			Not integrated
14	-	nvoLvgCndWTemp	Out	SNVT_temp_p	ram	Leaving Condenser Water Temperature			Not integrated
15	nvoAlrmDescr_xxx	nvoAlarmDescr	Out	SNVT_Count (Remark: SNVT type “SNVT_str_asc” according to chiller profile 8040 is replaced by SNVT_Count)	ram	Alarm annunciation text	0 - 65535		Read-out active safeties Refer to “overview of integer values of safety codes”
16	nvoChlrStat_xxx	nvoChillerstat	Out	SNVT_chlr_stat	ram	Chiller Status	Structure		

LON (based on profile Chiller 8040 but extended with xxx)			
	chlr_run_mode (chiller_t)	chlr_off=0, chlr_run=2	Read-out status of on/off LED
	chlr_op_mode (hvac_t)	HVAC_HEAT : 1 = Heating HVAC_COOL : 3 = Cooling	Read-out cooling heating mode
	chlr_state	Structure	
		In_alarm: 0=No alarm, 1=In alarm	Read-out alarm active or not
		Run_enable: 0=Chiller not allowed to start 1=Chiller can start	Read-out if a compressor has the “CAN STARTUP” status or not
		Local: 0=Values can be changed remotely 1=Values cannot be changed remotely	Not integrated Always value 0
		Limited: 0=no limitation 1=Limitation active	Read-out if a compressor is limited (=“LIMIT”) or not
		CHW_flow: 0=No Chiller water flow 1=Chiller -water flow detected	Read-out flow switch status
		CONDW_flow : 0= No Condenser Water flow 1=Condenser water flow detected	Not integrated Always value 0
		All other bits unused	

2

Overview integer values of safety codes

@difference between softcopy input files (installation manual) and print-out@

Value		Message safety menu
0	UNIT SAFETY	No safety
1	UNIT SAFETY	"0F0:EMERGENCY STOP"
2	UNIT SAFETY	"0AE:FLOW HAS STOPPED"
4	UNIT SAFETY	"0C9:INL SENSOR ERR"
5	UNIT SAFETY	"0CA:OUT SENSOR ERR"
6	UNIT SAFETY	"0H9:AMB T SENSOR ERR"
9	UNIT SAFETY	"0U4:EXT PCB COMM.ERR"
10	UNIT SAFETY	"0U4:MAINPCB COMM.ERR"
12	UNIT SAFETY	"0AE:PUMPINTERLOCK"
14	UNIT WARNING	"0AE:FLOW HAS STOPPED"
16	UNIT WARNING	"0C9:INL SENSOR ERR"
17	UNIT SAFETY	"0A9:EEV PCB COMM ERR"
18	UNIT SAFETY	"0A9:EEV PCB ERR"
19	UNIT SAFETY	"0UA:OP.NOT CONFIRMED"
29	UNIT SAFETY	"0U5:PCB COMM.PROBLEM"
30	CIRCUIT 1 SAFETY	"1U1:REV PHASE PROT"
31	CIRCUIT 1 SAFETY	"1E3:HIGH PRESSURE SW"
35	CIRCUIT 1 SAFETY	"1E4:LOW PRESSURE"
37	CIRCUIT 1 SAFETY	"1JA:HP SENSOR ERR"
38	CIRCUIT 1 SAFETY	"1JC:LP SENSOR ERR"
42	CIRCUIT 1 SAFETY	"153:FAN INV ERR."
44	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR1"
45	CIRCUIT 1 SAFETY	"1F3:HIGH DISCH TEMP1"
46	UNIT WARNING	"153:FAN OVERC. ST1"
47	UNIT WARNING	"153:FAN OVERC. ST2"
48	UNIT WARNING	"153:FAN OVERC. ST3"
49	CIRCUIT 1 SAFETY	"1A9:EEV ERR"
50	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST1"
51	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST2"
52	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST3"
53	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERR"
54	CIRCUIT 1 SAFETY	"1A9:SUPERHEAT ERR"
56	UNIT WARNING	"1E3:HP SETBACK"
57	UNIT WARNING	"1E6:COMP PR"
58	CIRCUIT 1 SAFETY	"1E6:COMPR 1 SAFETY"
59	CIRCUIT 1 SAFETY	"1E6:COMPR 2 SAFETY"
60	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR2"
61	CIRCUIT 1 SAFETY	"1F3:HIGH DICH TEMP2"

Value		Message safety menu
62	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH1"
63	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH2"
64	UNIT WARNING	"1J6:COIL1 SENSOR ERR"
65	UNIT WARNING	"1J7:COIL2 SENSOR ERR"
66	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
67	UNIT SAFETY	"0A4:FREEZE UP C1"
70	CIRCUIT 2 SAFETY	"1U1:REV PHASE PROT"
71	CIRCUIT 2 SAFETY	"1E3:HIGH PRESSURE SW"
75	CIRCUIT 2 SAFETY	"1E4:LOW PRESSURE"
77	CIRCUIT 2 SAFETY	"1JA:HP SENSOR ERR"
78	CIRCUIT 2 SAFETY	"1JC:LP SENSOR ERR"
82	CIRCUIT 2 SAFETY	"153:FAN INV ERR."
84	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR1"
85	CIRCUIT 2 SAFETY	"1F3:HIGH DISCH TEMP1"
86	UNIT WARNING	"253:FAN OVERC. ST1"
87	UNIT WARNING	"253:FAN OVERC. ST2"
88	UNIT WARNING	"253:FAN OVERC. ST3"
89	CIRCUIT 2 SAFETY	"1A9:EEV ERR"
90	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST1"
91	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST2"
92	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST3"
93	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERR"
94	CIRCUIT 2 SAFETY	"1A9:SUPERHEAT ERR"
96	UNIT WARNING	"2E3:HP SETBACK"
97	UNIT WARNING	"2E6:COMP PR"
98	CIRCUIT 2 SAFETY	"1E6:COMPR 1 SAFETY"
99	CIRCUIT 2 SAFETY	"1E6:COMPR 2 SAFETY"
100	CIRCUIT 2 SAFETY	"1J3:DICHSENSOR ERR2"
101	CIRCUIT 2 SAFETY	"1F3:HIGH DICH TEMP2"
102	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH1"
103	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH2"
104	UNIT WARNING	"2J6:COIL1 SENSOR ERR"
105	UNIT WARNING	"2J7:COIL2 SENSOR ERR"
106	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
107	UNIT SAFETY	"0A4:FREEZE UP C2"
190	NETWORK SAFETY	"0U4:PCB COMM.PROBLEM"
191	NETWORK SAFETY	"0CA:OUT E SENSOR ERR"
192	NETWORK SAFETY	"0C9:INL E SENSOR ERR"
194	NETWORK SAFETY	"0U4:SW VERSION ERR"

1.7 Function

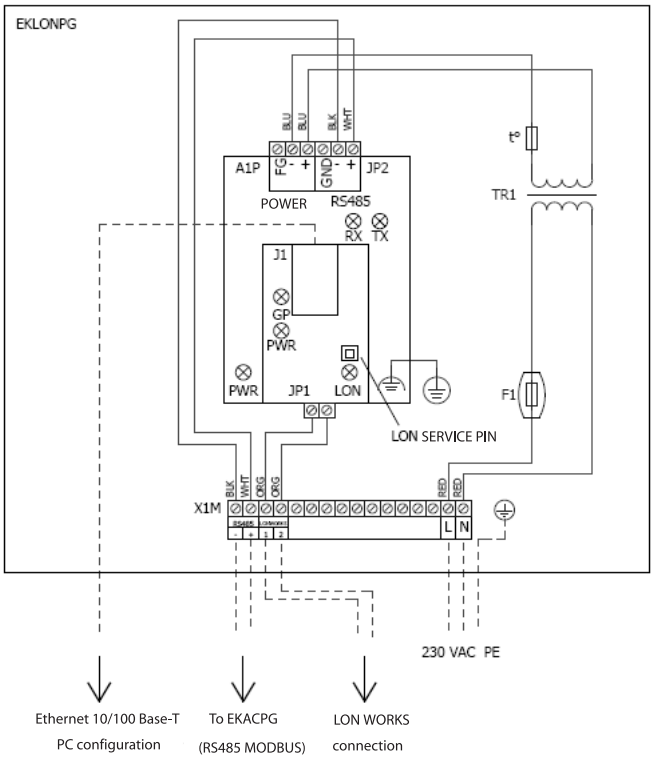
Main functions

Functions	EKLONPG
Monitor and control:	
On- Off	O
Thermostat setpoints	O
Cooling/heating mode	O
Capacity limitation	O
Low noise mode (only OPIF)	-
Monitor:	
Error (active/ not active, code) of highest priority active error	O
Inlet, outlet sensor temperature	O
Unitcapacity	O

O = function possible

1.8 Wiring diagram

A1P	Printed circuit board
F1	Fuse (1A)
TR1	Power supply transformer (230 V/ 21.8 V)
X1M	Terminal strip



Connect cables according to specifications in the table below.

Connection to	
LonWorks® network	LonWorks® network communication wiring, no polarity.
Configuration PC	In case of communication via hub, use a ethernet 10/100 Base-T straight cable (field supply). In case of direct communication use a ethernet 10/100 Base-T cross cable (field supply).
RS485 Modbus connection	Use a 0.75~1.25 mm^2 2-wire cable of maximum 500 m measured from gateway to last unit in line (+/- polarity).
Power supply	Use a 1.5 mm^2 2-wire + earth cable and perform grounding.

2 Functional specifications

2.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

Topic	See page
2.2 <EKLONPG> LON gateway	2–18

2.2 <EKLONPG> LON gateway

Summary

The LON gateway enables interfacing between the chiller unit and the LonWorks® network.

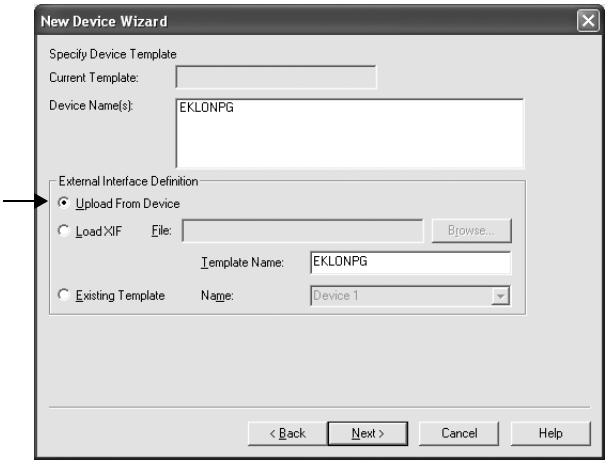
Units installed in such configuration can be monitored and operated on the LonTalk® communication.

The LON objects are based on the Lonmark function profile 8040. For more information regarding the LonWorks® network and the Lon profile refer to the internet www.lonmark.org

For details concerning the multiscroll integration refer to chapter “56171456 LON objects” @To which chapter does this need to refer?@."LON objects" on page 2–11

XIF file

An external interface file (XIF file) is NOT provided. The procedure for obtaining the XIF file is to upload it from the LON gateway during commissioning. Refer to below figure (“Upload from Device”):



Background: Each time the LON gateway is configured (refer to "Gateway configuration" on page 2–19 and "Gateway configuration" on page 3–21), the gateway creates an internal a xif file based on the loaded configuration file.

3 Gateway configuration

3.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

Topic	See page
3.2 Configuration file	2–20
3.3 Downloading the configuration file to the gateway	2–21

3.2 Configuration file

The configuration files should be available on the DENV extranet (Service department).

Number of connected chillers

Select the file based on the nr of units that will be connected to the gateway.

Nr of units connected to gateway	LON configuration file
1	configLON_PC_Daikin_1unit_v0_6.csv
2	configLON_PC_Daikin_2units_v0_6.csv
...	
8	configLON_PC_Daikin_8units_v0_6.csv

Modbus address

Modbus address is defined in the configuration file. The modbus address can be modified as follows:

Node_ID	Modbus address	Default: 01, 02, 03, ... 08 (depending on nr of units) Range: 01 ... 32

Example: configBN_PC_Daikin_1unit_v0_6.csv

```
//===============================================================================
//
// Client Side Nodes
//
Nodes
Node_Name, Node_ID, Protocol, Port
PLC_01, 01, Modbus_RTU, S1
```

Example: configBN_PC_Daikin_8units_v0_6.csv

```
//===============================================================================
//
// Client Side Nodes
//
Nodes
Node_Name, Node_ID, Protocol, Port
PLC_01, 01, Modbus_RTU, S1
PLC_02, 02, Modbus_RTU, S1
PLC_03, 03, Modbus_RTU, S1
PLC_04, 04, Modbus_RTU, S1
PLC_05, 05, Modbus_RTU, S1
PLC_06, 06, Modbus_RTU, S1
PLC_07, 07, Modbus_RTU, S1
PLC_08, 08, Modbus_RTU, S1
```

3.3 Downloading the configuration file to the gateway

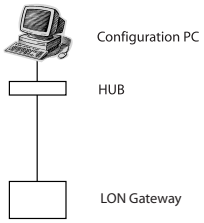
Overview hardware/ software/ setup

The software should be available on the DENV extranet (Service department).

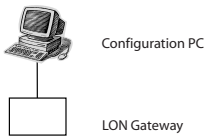
Software	“Remote user interface” (ruinet.exe) “Ping utility” (ruiping.exe)	These programs are the result after installing “Install.zip” Install.zip can be downloaded from the internet “http://www.protocessor.com/tech_support/utilities.html”

Hardware setup:

1. via hub



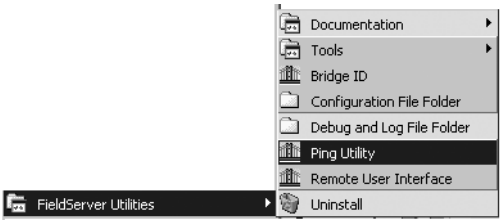
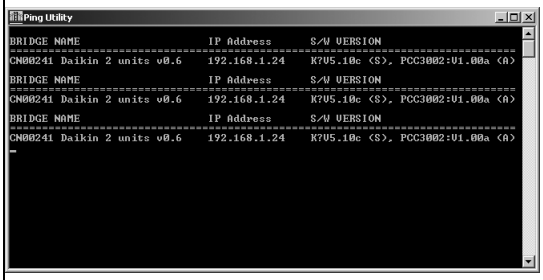
2. via Ethernet cross-over cable



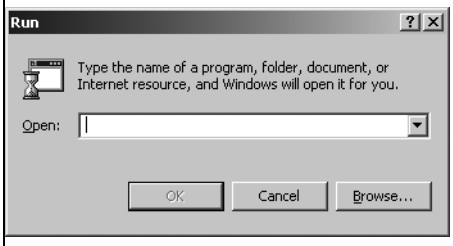
2

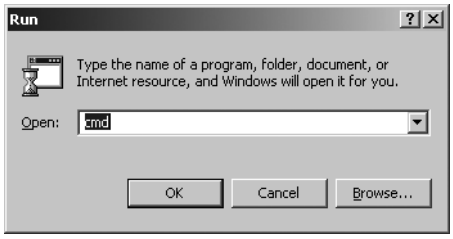
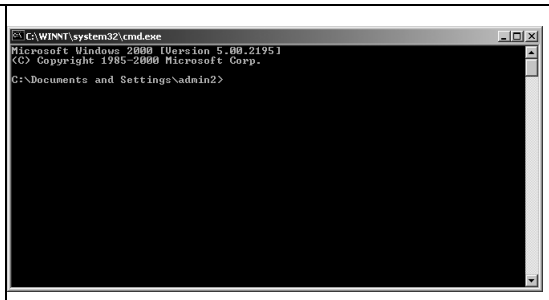
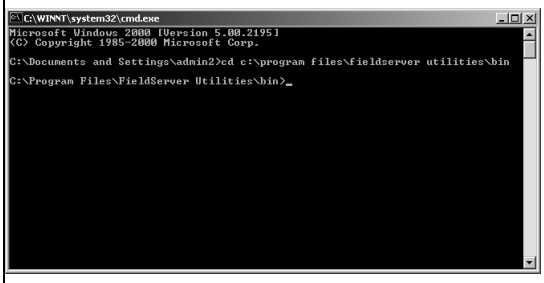
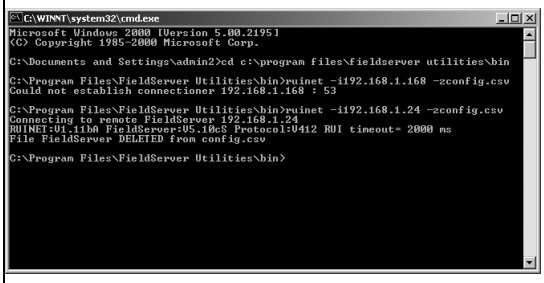
Download process

Step1: Identification of the IP number of the gateway => use ping utility

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > ping utility: Start “Ping utility” (ruiping.exe) 	The display should show:  If it does not (even after repeated attempts) then either the network cabling is incorrect or the computer network card is faulty or incorrectly configured. ■ Check the Ethernet link OK led. ■ Check the “activity” led on the ethernet connection, this should flash at least once every 2 seconds if rui is still running, and perhaps more often, depending on the network traffic. ■ Check that the IP address of the PC is within the same network (192.168.1.xxx) of the gateway. The default IP address of the gateway is 192.168.1.24, submask is 255.255.255.0. ■ Confirm that there is an ethernet adapter installed in the PC’s device manager list, and that it is configured to run the TCP/IP protocol. ■ If using Windows XP, ensure that the firewall is disabled.

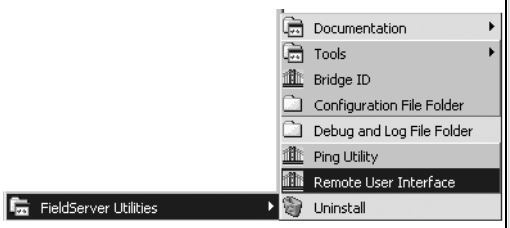
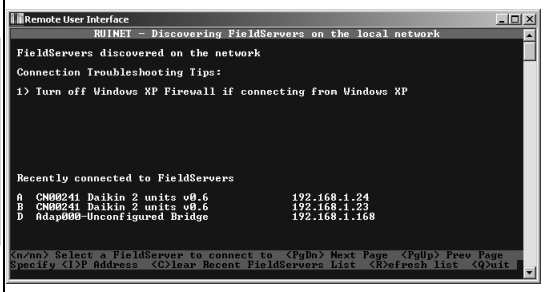
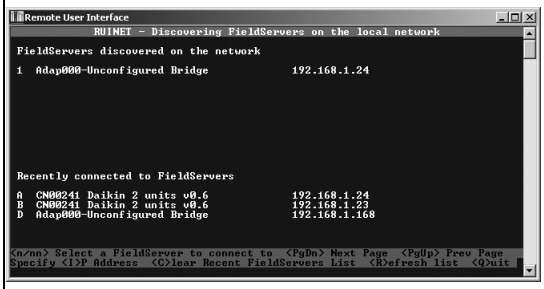
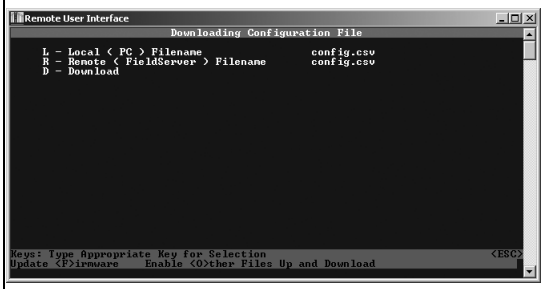
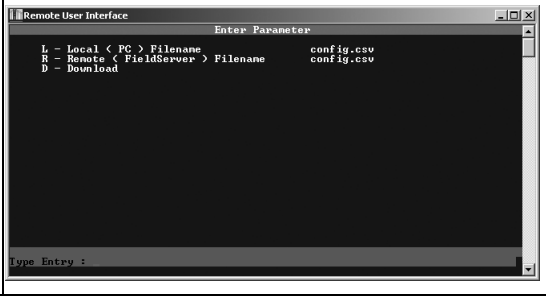
Step2: Make the gateway empty

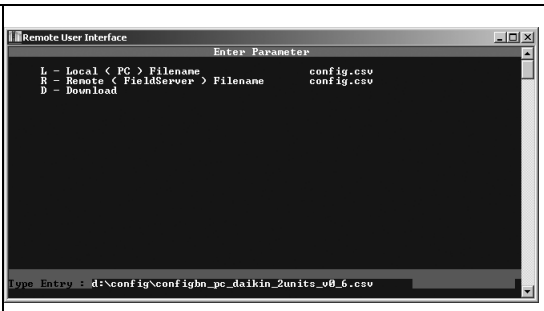
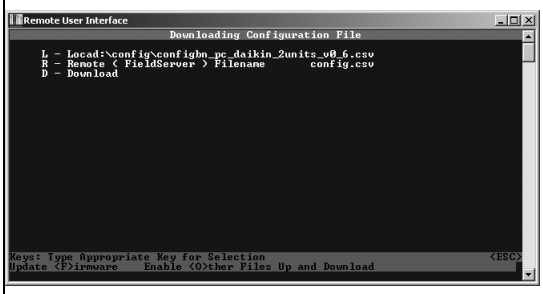
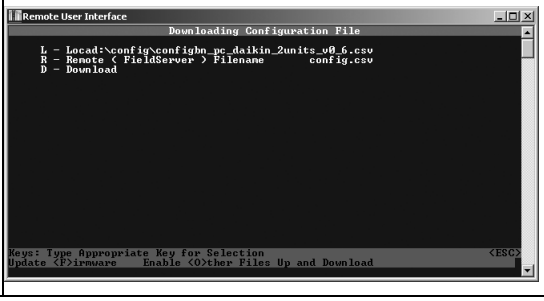
Action	Result
1. Go to “START” Click on “run...” 	

2. Now type “cmd” into the window  Press “enter”	
3. Type (e.g. Depending on installation directory) “cd c:\program files\fieldserver utilities\bin” + enter	After a few seconds you get this window 
4. Type “ruinet -i192.168.1.24 -zconfig.csv” + enter (Remark: IP address should be equal to the IP gateway address)	
5. Switch the power off and on to reset the gateway	

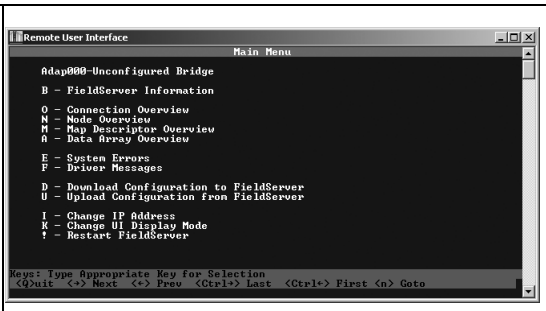
2

Step3: Connect to the gateway (ruinet)

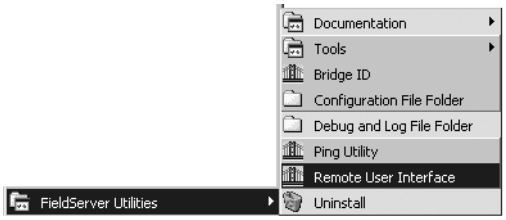
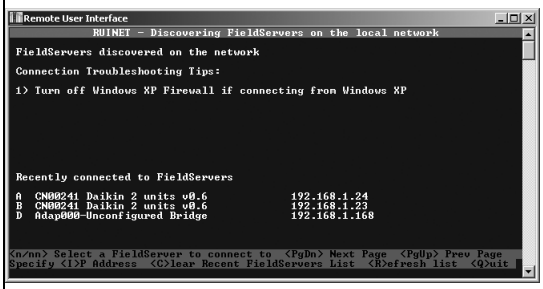
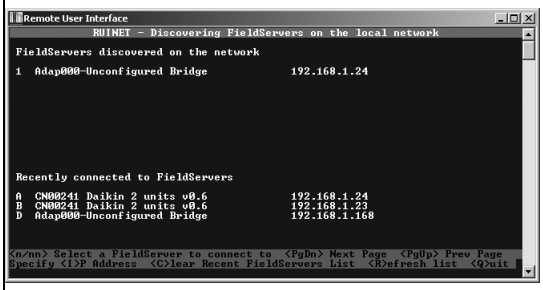
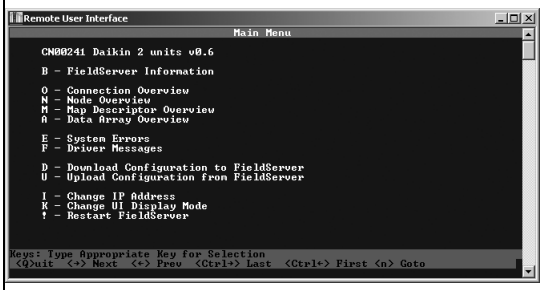
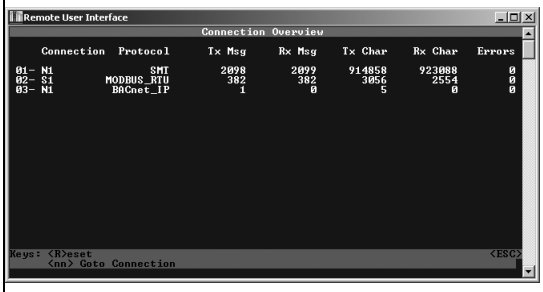
Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > Remote User Interface  Documentation Tools Bridge ID Configuration File Folder Debug and Log File Folder Ping Utility Remote User Interface Uninstall FieldServer Utilities	The display should show:  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network Connection Troubleshooting Tips: 1> Turn off Windows XP Firewall if connecting from Windows XP Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit When the gateway is discovered. (Remark: after power up the gateway this can take up to 90 sec)  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network 1 Adap000-Unconfigured Bridge 192.168.1.24 Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit
2. Press the item of the discovered gateway. In this case press “1”	Remote User Interface Main Menu Adap000-Unconfigured Bridge B - FieldServer Information O - Connection Overview N - Node Overview M - Map Descriptor Overview A - Data Array Overview E - System Errors F - Driver Messages D - Download Configuration to FieldServer U - Upload Configuration from FieldServer I - Change IP Address K - Change UI Display Mode ! - Restart FieldServer Keys: Type Appropriate Key for Selection <Q>uit <→> Next <←> Prev <Ctrl→> Last <Ctrl←> First <n> Goto
3. Press “D” to enter the download configuration menu	 Remote User Interface Downloading Configuration File L - Local (PC) Filename config.csv R - Remote (FieldServer) Filename config.csv D - Download Keys: Type Appropriate Key for Selection <ESC> Update <F>irmware Enable <O>ther Files Up and Download
4. Press “L” to enter the configuration file name	 Remote User Interface Enter Parameter L - Local (PC) Filename config.csv R - Remote (FieldServer) Filename config.csv D - Download Type Entry :

5. Type the configuration file name (including drive + directory) Example: “d:\config\configbn_pc_daikin_2units_v0_6.csv”	
6. Press “enter”	If the file exist it is shown on screen 
7. Press “D”	Download starts At the end following message is displayed:
8. Press any key to continue	

2

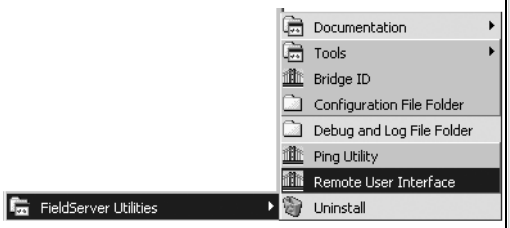
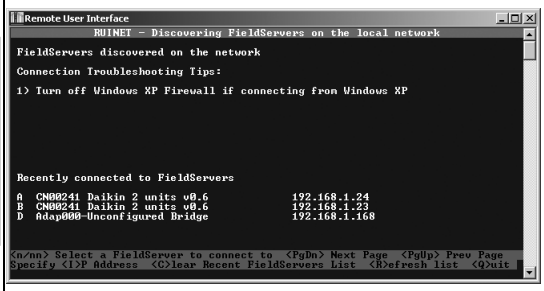
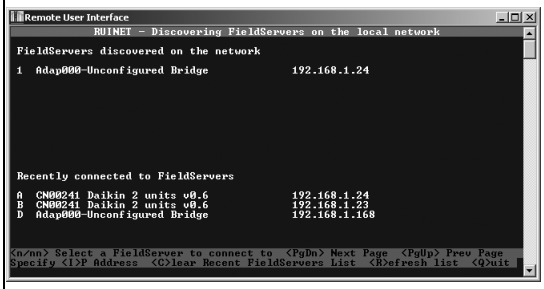
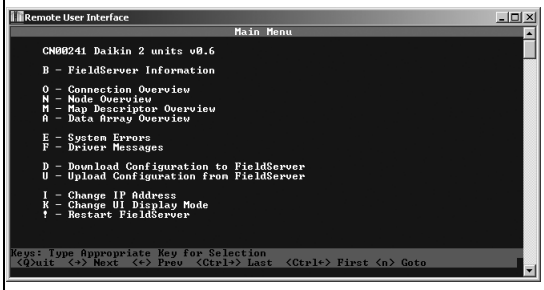
9. Press “ESC” to go back to main menu	
10. Press “!” to restart gateway	 If restart is successful the main menu with the down-loaded configuration file is shown.

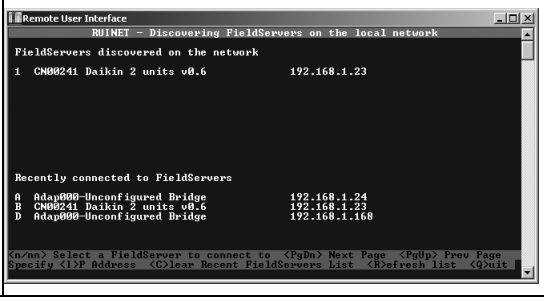
Monitor communication

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > Remote User Interface 	The display should show:  When the gateway is discovered. (Remark: after power up the gateway this can take up to 90 sec) 
2. Press the item of the discovered gateway. In this case press “1”	
3. Press “O”	 The communication can be consulted: SMT: the internal gateway functionality Modbus: the modbus communication BACnet_IP: the BACnet communication

2

Change IP address

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > Remote User Interface  Documentation Tools Bridge ID Configuration File Folder Debug and Log File Folder Ping Utility Remote User Interface FieldServer Utilities Uninstall	The display should show:  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network Connection Troubleshooting Tips: 1) Turn off Windows XP Firewall if connecting from Windows XP Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit When the gateway is discovered. (Remark: after power up the gateway this can take up to 90 sec)  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network 1 Adap000-Unconfigured Bridge 192.168.1.24 Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit
2. Press the item of the discovered gateway. In this case press “1”	 Remote User Interface Main Menu CN00241 Daikin 2 units v0.6 B - FieldServer Information O - Connection Overview N - Node Overview M - Map Descriptor Overview A - Data Array Overview E - System Errors F - Driver Messages D - Download Configuration to FieldServer U - Upload Configuration from FieldServer I - Change IP Address K - Change UI Display Mode ! - Restart FieldServer Keys: Type Appropriate Key for Selection <Q>uit <+> Next <-> Prev <Ctrl+> Last <Ctrl<> First <n> Goto
3. Press “I”	Remote User Interface Edit IP Address Settings 1 - N1 IP Address 192.168.1.24 2 - N1 Netmask 255.255.255.0 3 - N1 Gateway 1 192.168.1.1 4 - N1 DHCP Client State DISABLED 5 - N1 DHCP Server State DISABLED Keys: Type Appropriate Key for Selection <ESC>
4. Press “1” and enter new IP address Example 192.168.1.23	Remote User Interface Enter Parameter 1 - N1 IP Address 192.168.1.24 2 - N1 Netmask 255.255.255.0 3 - N1 Gateway 1 192.168.1.1 4 - N1 DHCP Client State DISABLED 5 - N1 DHCP Server State DISABLED Changes only become active once the FieldServer has been restarted. Press any key to continue. Type Entry : 192.168.1.23
5. Close the “remote user interface” push “End now” if requested	

6. Switch to power off and on of the gateway	
7. Restart Remote User Interface	

Remote User Interface
RUINET - Discovering FieldServers on the local network
FieldServers discovered on the network
1 CN00241 Daikin 2 units v0.6 192.168.1.23
Recently connected to FieldServers
A Adap000-Unconfigured Bridge 192.168.1.24
B CN00241 Daikin 2 units v0.6 192.168.1.23
D Adap000-Unconfigured Bridge 192.168.1.168
<n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page
Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit

4 Communication procedure

4.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

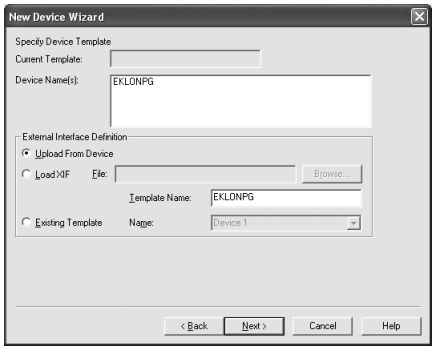
Topic	See page
4.2 LonMaker V3.1	2–32

4.2 LonMaker V3.1

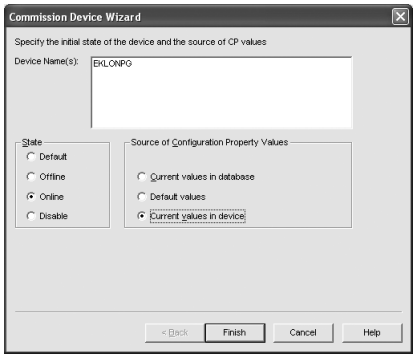
For procedure how to use LonMaker V3.1 refer to VRV LON gateway service manual (Si72-305).

1. Commissioning procedure.

Main differences:
During commission of device, no external XIF file is used. Select the “Upload From Device”.

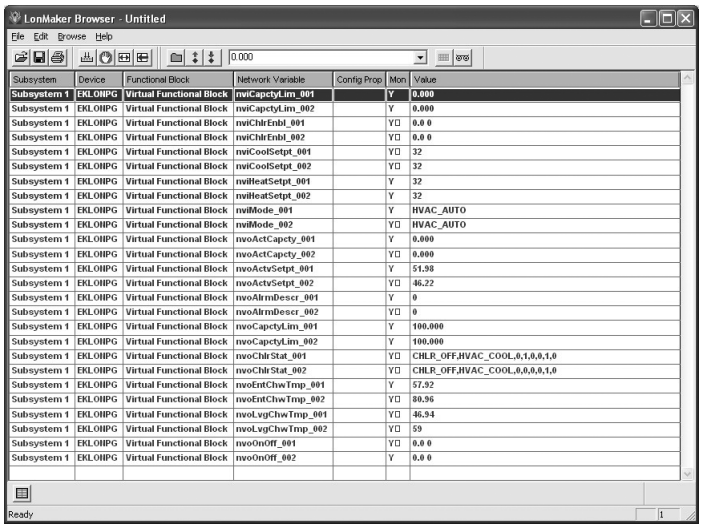


Other parts of the commissioning procedure are similar to the VRV LON gateway.

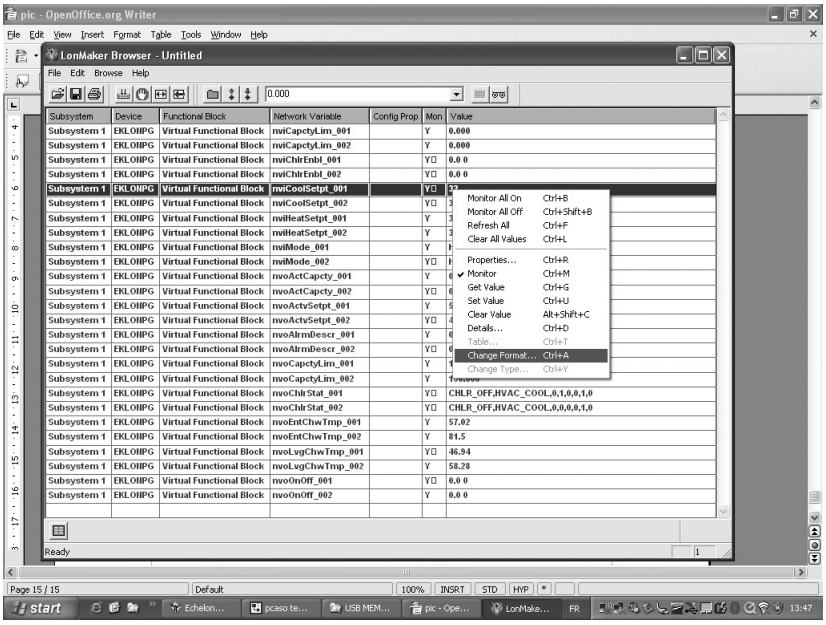


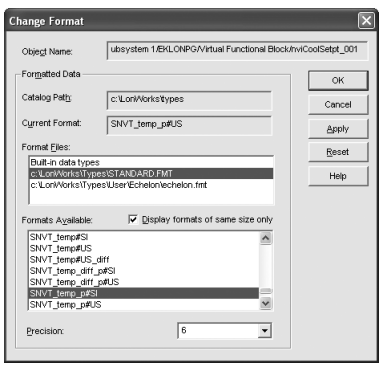
2. After commissioning the device can be browsed or a function block can be used to browse the available variables.

Example:


LonMaker Browser - Untitled
File Edit Browse Help
Subsystem | Device | Functional Block | Network Variable | Config Prop | Mon | Value
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_001 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_001 | | YO | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_002 | | YO | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_001 | | YO | 32
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_002 | | YO | 32
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_001 | | Y | 32
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_002 | | Y | 32
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_001 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_002 | | YO | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_001 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_002 | | YO | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_001 | | Y | 51.98
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_002 | | YO | 46.22
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_001 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_002 | | YO | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_001 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_002 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_001 | | YO | CHLR_OFF,HVAC_COOL,0,1,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_002 | | YO | CHLR_OFF,HVAC_COOL,0,0,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_001 | | Y | 57.92
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_002 | | YO | 80.96
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_001 | | YO | 46.94
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_002 | | YO | 59
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_001 | | YO | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_002 | | Y | 0.0 0
Ready

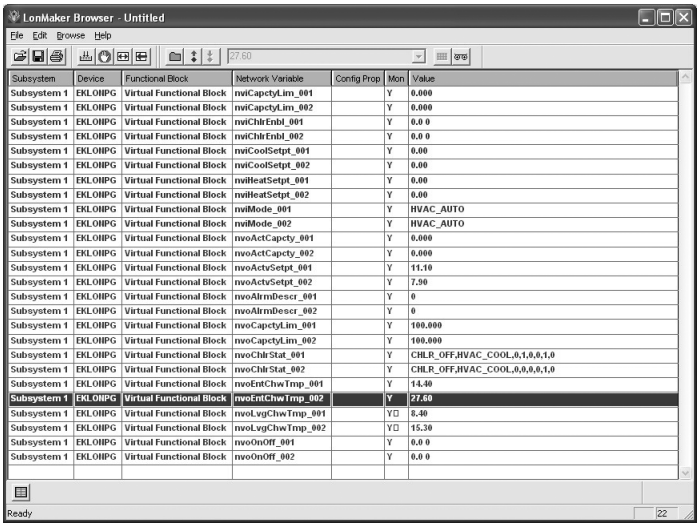
Remark: All the temperature values are in Fahrenheit. Each variable can be modified to Celsius by selecting the variable and right click and select “Change Format”. Then change format from SNVT_temp_p#US to SNVT_temp_p#IS.





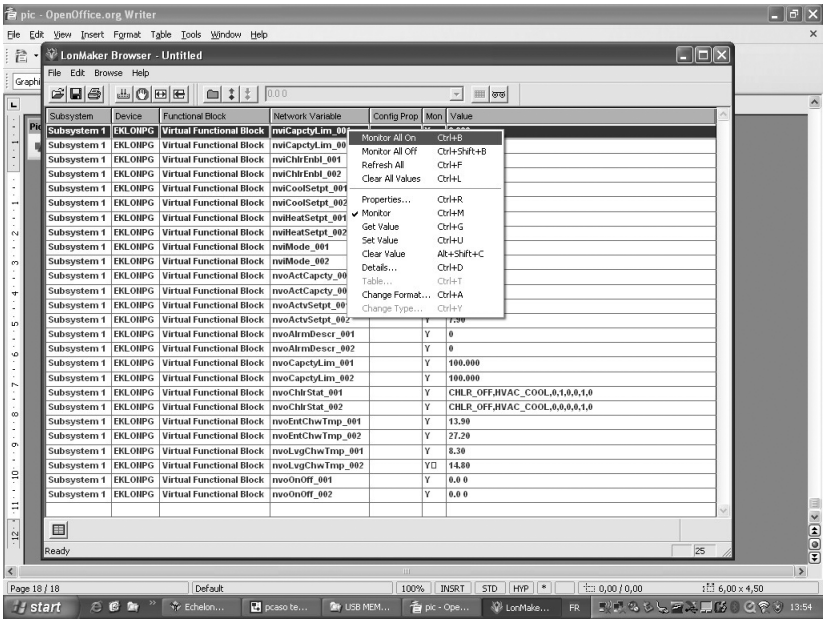
2

Result:


LonMaker Browser - Untitled
File Edit Browse Help
Subsystem | Device | Functional Block | Network Variable | Config Prop | Mon | Value
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_001 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_001 | | Y | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_002 | | Y | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_001 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_002 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_001 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_002 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_001 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_002 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_001 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_001 | | Y | 11.10
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_002 | | Y | 7.90
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_001 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_002 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_001 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_002 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_001 | | Y | CHLR_OFF,HVAC_COOL,0,1,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_002 | | Y | CHLR_OFF,HVAC_COOL,0,0,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_001 | | Y | 14.40
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_002 | | Y | 27.60
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_001 | | Y | 8.40
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_002 | | Y | 15.30
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_001 | | Y | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_002 | | Y | 0.0 0
Ready

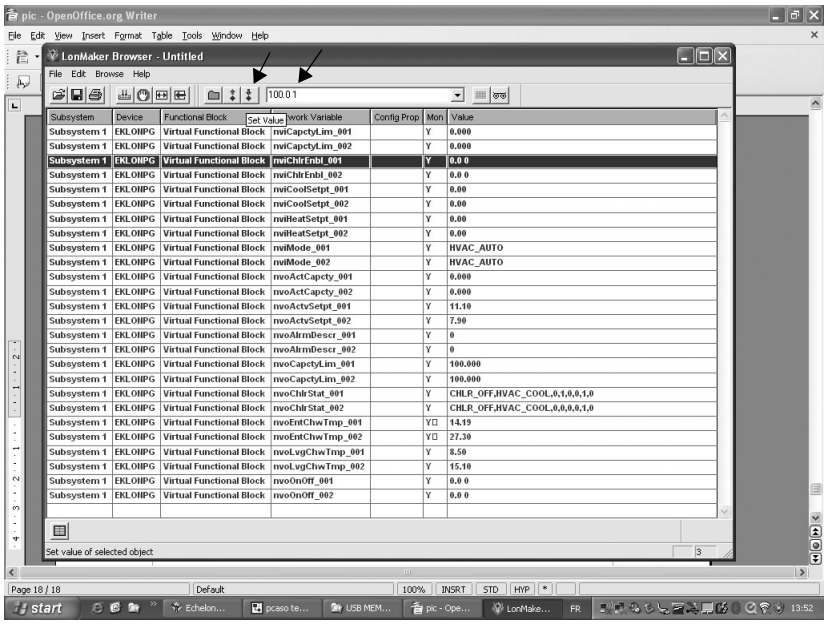
Remark: As described in the variable details all the nvi have default value 0.

To monitor all variables continuously, right click on a variable and select “Monitor All On”.
Then all the status variables are continuously displayed.
Example: nvoOnOff_001 (“0.0 0” = off, “100.0 1” = on), nvoActSetp_001,...

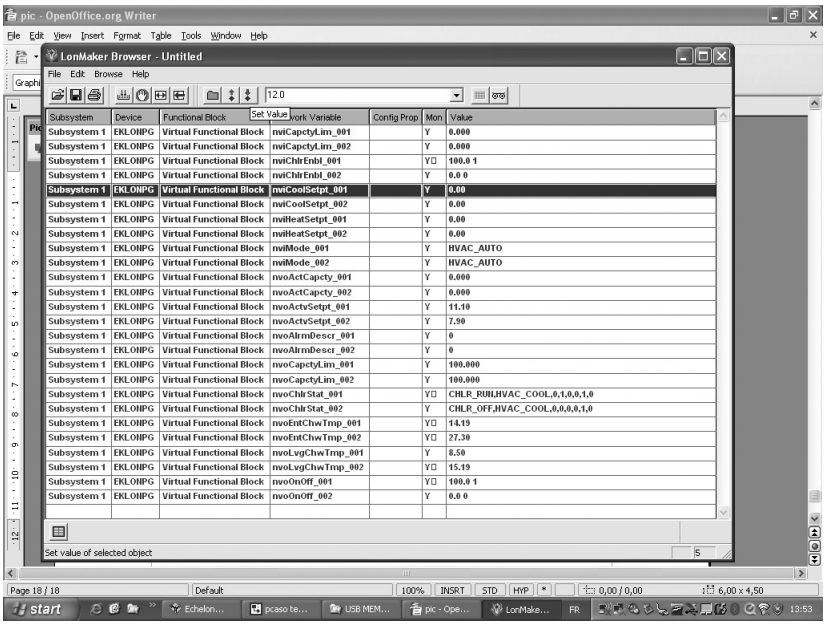


3. Example to switch unit on/off.

Double click on nviChlrEnbl_001
Modify value to “100.0 1” to switch unit on (or “0.0 0” to switch unit off) and click on “Set value” (or press enter).



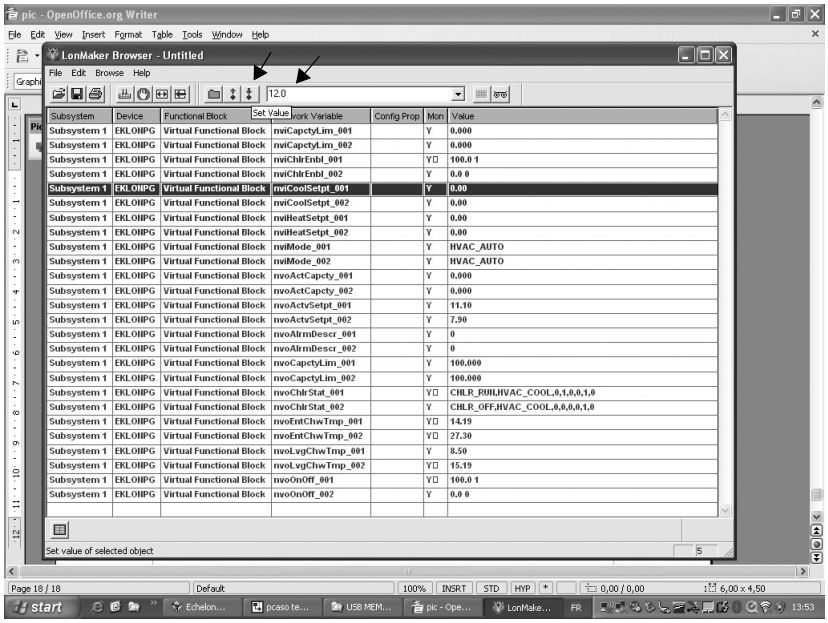
Result of switching unit can be monitored by checking status change of variable nvoOnOff_001. This variable will be changed to on when the unit has been switched on.



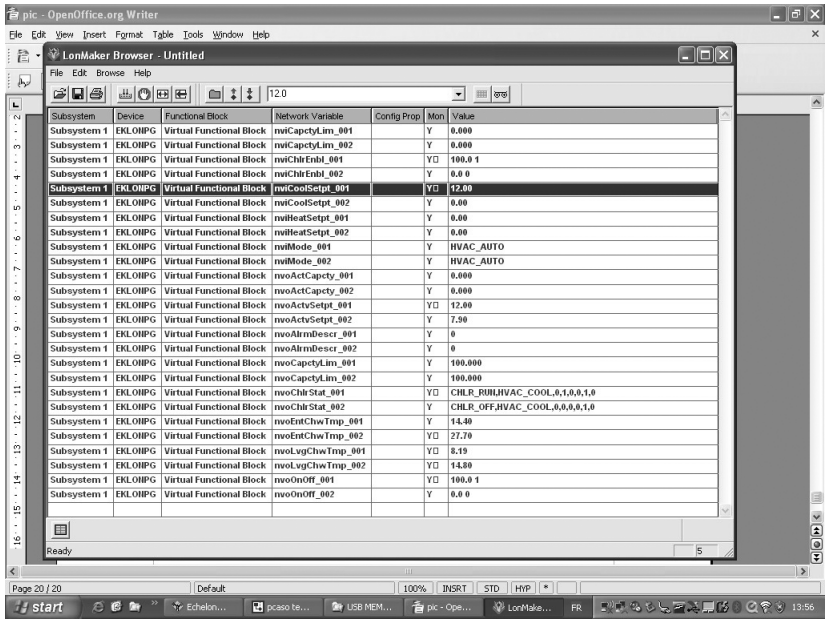
2

4. Example to modify setpoint.

Double click on nviCoolSetpt_001
Modify value to ex 12.0 and click on “Set value”.

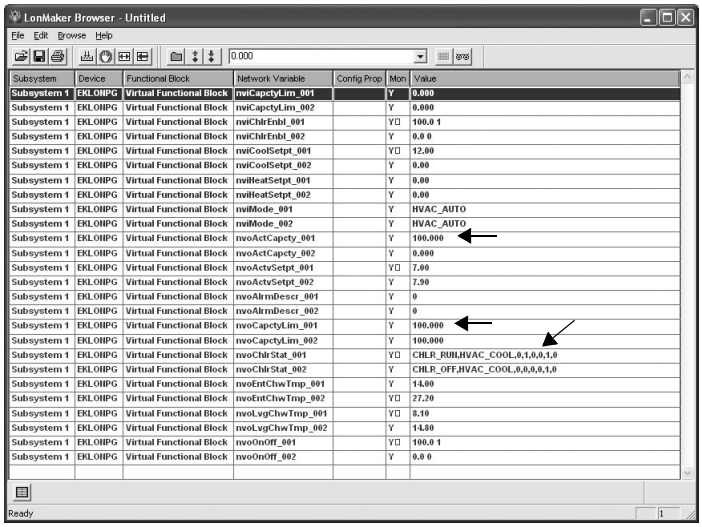


Result of modifying setpoint can be monitored by checking status change of variable nvoActSetp_001. This variable will be changed to new value (ex. 12.0), when the unit accepts the value.



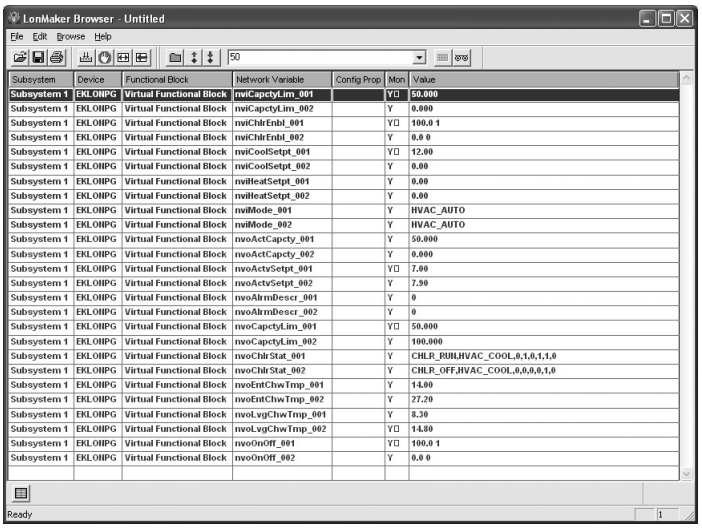
5. Example to modify limit settings

Status of unit:
nvoCapctyLim_001 is 100 (100%= no limitation)
nvoActCapcty_001 is 100 (100%)
nvoChlrStat_001 (limited bit) is 0 (0= no limitation active)


LonMaker Browser - Untitled
File Edit Browse Help
0.000
Subsystem | Device | Functional Block | Network Variable | Config Prop | Mon | Value
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_001 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_001 | | YD | 100.0 1
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_002 | | Y | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_001 | | YD | 12.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_002 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_001 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_002 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_001 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_002 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_001 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_001 | | YD | 7.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_002 | | Y | 7.90
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_001 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_002 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_001 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_002 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_001 | | YD | CHLR_RUN,HVAC_COOL,0,1,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_002 | | Y | CHLR_OFF,HVAC_COOL,0,0,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_001 | | Y | 14.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_002 | | YD | 27.20
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_001 | | YD | 8.10
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_002 | | Y | 14.80
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_001 | | YD | 100.0 1
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_002 | | Y | 0.0 0
Ready

Modify the nviCapctyLim_001 to value 50 (= 50%).

Result: nvoCapctyLim_001 will be modified to 50 (= 50%)
nvoActCapcty_001 will go to 50 (= 50%)
nvoChlrStat_001 (limited bit) will go to 1 (1= limitation active)


LonMaker Browser - Untitled
File Edit Browse Help
50
Subsystem | Device | Functional Block | Network Variable | Config Prop | Mon | Value
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_001 | | YD | 50.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCapctyLim_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_001 | | YD | 100.0 1
Subsystem 1 | EKLONPG | Virtual Functional Block | nviChlrEnbl_002 | | Y | 0.0 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_001 | | YD | 12.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviCoolSetpt_002 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_001 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviHeatSetpt_002 | | Y | 0.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_001 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nviMode_002 | | Y | HVAC_AUTO
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_001 | | Y | 50.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActCapcty_002 | | Y | 0.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_001 | | YD | 7.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoActvSetpt_002 | | Y | 7.90
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_001 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoAlrmDescr_002 | | Y | 0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_001 | | YD | 50.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoCapctyLim_002 | | Y | 100.000
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_001 | | Y | CHLR_RUN,HVAC_COOL,0,1,0,1,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoChlrStat_002 | | Y | CHLR_OFF,HVAC_COOL,0,0,0,0,1,0
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_001 | | Y | 14.00
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoEntChwTmp_002 | | Y | 27.20
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_001 | | Y | 8.30
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoLvgChwTmp_002 | | YD | 14.80
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_001 | | YD | 100.0 1
Subsystem 1 | EKLONPG | Virtual Functional Block | nvoOnOff_002 | | Y | 0.0 0
Ready

5 LON objects

The following table contains an overview of the possible LON objects.

LON (based on profile Chiller 8040 but extended with xxx)

NV #	Name xxx=Chiller nr	Reference name according to Chiller profile 8040	In/ Out	SNVT Type (SNVT Index)	Class	Description (according to Chiller profile 8040)	Valid range		Additional explanation
1	nviChlrEnbl_xxx	nviChillerEnable	In	SNVT_switch	ram	Request Start/ Stop Chiller	0 or 1	0 = Request Chiller Off 1 = Request Chiller On	Control on/off state by pushing on/off button (After turning the LON gateway On, the default value is “0”)
2	nviCoolSetpt_xxx	nviCoolSetpt	In	SNVT_temp_p	ram	Desired Temp of Lvg Chilled Wtr	°C range depending on unit type		Control cooling setpoint (inlet/outlet depending on thermostat mode) (After turning the LON gateway On, the default value is “0”)
3	nvoOnOff_xxx	nvoOnOff	Out	SNVT_switch	ram	Chiller On / Off run state	0 or 1	0 = Chiller Off 1 = Chiller On	Read-out status of on/off LED
4	nvoActvSetpt_xxx	nvoActiveSetpt	Out	SNVT_temp_p	ram	Active Cool or Heat Setpt	°C range depending on unit type		Read-out active setpoint (Cooling/heating/ inlet/outlet depending active thermostat mode)
5	nviCapctyLim_xxx	nviCapacityLim	In	SNVT_lev_percent	ram	Capacity Limit of Chiller	For units with 1 circ: 0% or 50% or 100% For units with 2 circ: 0% or 25% or 50% or 75% or 100%		Control capacity limitation (After turning the LON gateway On, the default value is “0”)
6	-	nviEntChwTemp	In	SNVT_temp_p	ram	Accommodates Remote Temp Sensor input			Not integrated
7	nviMode_xxx	nviMode	In	SNVT_Hvac_mode	ram	Chiller Mode s	SNVT_hvac_mode	HVAC_HEAT : 1 = Heating HVAC_COOL : 3 = Cooling	Control cooling-heating mode (After turning the LON gateway On, the default value is “0”)

2

LON (based on profile Chiller 8040 but extended with xxx)									
8	nviHeatSetpt_xxx	nviHeatSetpt	In	SNVT_temp_p	ram	Heating Setpoint	°C range depending on unit type		Control heating setpoint (inlet/outlet depending on thermostat mode) (After turning the LON gateway On, the default value is “0”)
9	nvoActCapcty_xxx	nvoActualCapacity	Out	SNVT_lev_percent	ram	Actual Running Capacity of Unit	range 0% or 25% or 50% or 75% or 100%		Read-out capacity of unit
10	nvoCapctyLim_xxx	nvoCapacityLim	Out	SNVT_lev_percent	ram	Current Capacity Limit Setting of Chiller	range 0% or 25% or 50% or 75% or 100%		Read-out capacity limitation setting of unit
11	nvoLvgChwTmp_xxx	nvoLvgChwTemp	Out	SNVT_temp_p	ram	Leaving Chilled Water Temp	°C range depending on unit type		Read-out Outlet water temp
12	nvoEntChwTmp_xxx	nvoEntChwTemp	Out	SNVT_temp_p	ram	Temp	°C range depending on unit type		Read-out Inlet water temp
13	-	nvoEntCndWTemp	Out	SNVT_temp_p	ram	Entering Condenser Water Temp			Not integrated
14	-	nvoLvgCndWTemp	Out	SNVT_temp_p	ram	Leaving Condenser Water Temp			Not integrated
15	nvoAlrmDescr_xxx	nvoAlarmDescr	Out	SNVT_Count (Remark: SNVT type “SNVT_str_asc” according to chiller profile 8040 is replaced by SNVT_Count)	ram	Alarm annunciation text	0 - 65535		Read-out active safeties Refer to “overview of integer values of safety codes”
16	nvoChlrStat_xxx	nvoChillerstat	Out	SNVT_chlr_stat	ram	Chiller Status	Structure		

LON (based on profile Chiller 8040 but extended with xxx)			
	chlr_run_mode (chiller_t)	chlr_off=0, chlr_run=2	Read-out status of on/off LED
	chlr_op_mode (hvac_t)	HVAC_HEAT : 1 = Heating HVAC_COOL : 3 = Cooling	Read-out cooling heating mode
	chlr_state	Structure	
		In_alarm: 0=No alarm, 1=In alarm	Read-out alarm active or not
		Run_enable: 0=Chiller not allowed to start 1=Chiller can start	Read-out if a compressor has the “CAN STARTUP” status or not
		Local: 0=Values can be changed remotely 1=Values cannot be changed remotely	Not integrated Always value 0
		Limited: 0=no limitation 1=Limitation active	Read-out if a compressor is limited (=“LIMIT”) or not
		CHW_flow: 0=No Chiller water flow 1=Chiller -water flow detected	Read-out flow switch status
		CONDW_flow : 0=No Condenser Water flow 1=Condenser water flow detected	Not integrated Always value 0
		All other bits unused	

2

Overview integer values of safety codes

@difference between softcopy input files (installation manual) and print-out@

Value		Message safety menu
0	UNIT SAFETY	No safety
1	UNIT SAFETY	"0F0:EMERGENCY STOP"
2	UNIT SAFETY	"0AE:FLOW HAS STOPPED"
4	UNIT SAFETY	"0C9:INL SENSOR ERR"
5	UNIT SAFETY	"0CA:OUT SENSOR ERR"
6	UNIT SAFETY	"0H9:AMB T SENSOR ERR"
9	UNIT SAFETY	"0U4:EXT PCB COMM.ERR"
10	UNIT SAFETY	"0U4:MAINPCB COMM.ERR"
12	UNIT SAFETY	"0AE:PUMPINTERLOCK"
14	UNIT WARNING	"0AE:FLOW HAS STOPPED"
16	UNIT WARNING	"0C9:INL SENSOR ERR"
17	UNIT SAFETY	"0A9:EEV PCB COMM ERR"
18	UNIT SAFETY	"0A9:EEV PCB ERR"
19	UNIT SAFETY	"0UA:OP.NOT CONFIRMED"
29	UNIT SAFETY	"0U5:PCB COMM.PROBLEM"
30	CIRCUIT 1 SAFETY	"1U1:REV PHASE PROT"
31	CIRCUIT 1 SAFETY	"1E3:HIGH PRESSURE SW"
35	CIRCUIT 1 SAFETY	"1E4:LOW PRESSURE"
37	CIRCUIT 1 SAFETY	"1JA:HP SENSOR ERR"
38	CIRCUIT 1 SAFETY	"1JC:LP SENSOR ERR"
42	CIRCUIT 1 SAFETY	"153:FAN INV ERR."
44	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR1"
45	CIRCUIT 1 SAFETY	"1F3:HIGH DISCH TEMP1"
46	UNIT WARNING	"153:FAN OVERC. ST1"
47	UNIT WARNING	"153:FAN OVERC. ST2"
48	UNIT WARNING	"153:FAN OVERC. ST3"
49	CIRCUIT 1 SAFETY	"1A9:EEV ERR"
50	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST1"
51	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST2"
52	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST3"
53	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERR"
54	CIRCUIT 1 SAFETY	"1A9:SUPERHEAT ERR"
56	UNIT WARNING	"1E3:HP SETBACK"
57	UNIT WARNING	"1E6:COMP PR"
58	CIRCUIT 1 SAFETY	"1E6:COMPR 1 SAFETY"
59	CIRCUIT 1 SAFETY	"1E6:COMPR 2 SAFETY"
60	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR2"
61	CIRCUIT 1 SAFETY	"1F3:HIGH DICH TEMP2"

Value		Message safety menu
62	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH1"
63	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH2"
64	UNIT WARNING	"1J6:COIL1 SENSOR ERR"
65	UNIT WARNING	"1J7:COIL2 SENSOR ERR"
66	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
67	UNIT SAFETY	"0A4:FREEZE UP C1"
70	CIRCUIT 2 SAFETY	"1U1:REV PHASE PROT"
71	CIRCUIT 2 SAFETY	"1E3:HIGH PRESSURE SW"
75	CIRCUIT 2 SAFETY	"1E4:LOW PRESSURE"
77	CIRCUIT 2 SAFETY	"1JA:HP SENSOR ERR"
78	CIRCUIT 2 SAFETY	"1JC:LP SENSOR ERR"
82	CIRCUIT 2 SAFETY	"153:FAN INV ERR."
84	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR1"
85	CIRCUIT 2 SAFETY	"1F3:HIGH DISCH TEMP1"
86	UNIT WARNING	"253:FAN OVERC. ST1"
87	UNIT WARNING	"253:FAN OVERC. ST2"
88	UNIT WARNING	"253:FAN OVERC. ST3"
89	CIRCUIT 2 SAFETY	"1A9:EEV ERR"
90	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST1"
91	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST2"
92	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST3"
93	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERR"
94	CIRCUIT 2 SAFETY	"1A9:SUPERHEAT ERR"
96	UNIT WARNING	"2E3:HP SETBACK"
97	UNIT WARNING	"2E6:COMP PR"
98	CIRCUIT 2 SAFETY	"1E6:COMPR 1 SAFETY"
99	CIRCUIT 2 SAFETY	"1E6:COMPR 2 SAFETY"
100	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR2"
101	CIRCUIT 2 SAFETY	"1F3:HIGH DICH TEMP2"
102	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH1"
103	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH2"
104	UNIT WARNING	"2J6:COIL1 SENSOR ERR"
105	UNIT WARNING	"2J7:COIL2 SENSOR ERR"
106	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
107	UNIT SAFETY	"0A4:FREEZE UP C2"
190	NETWORK SAFETY	"0U4:PCB COMM.PROBLEM"
191	NETWORK SAFETY	"0CA:OUT E SENSOR ERR"
192	NETWORK SAFETY	"0C9:INL E SENSOR ERR"
194	NETWORK SAFETY	"0U4:SW VERSION ERR"

6 History

<EKLONPG> LON configuration file

Information for service manual (public)				internal use only
Item	Daikin version (date) Daikin title (example 1 unit) Daikin config file (example 1 unit) Daikin reference Software code Software version & date	Applicable units	Content	References, detailed content and bugs
1	V0.6 (23/08/2007) CN00256 Daikin 1 units v0.6 configLON_PC_Daikin_1units_v0_6.csv	EWA/YQ80-260	New	

7 Configuration files

@Is this chapter really necessary? This is already stated at the beginning of the two gateway configuration chapters@

The config files can be found on the Daikin extranet.

http://extranet.daikineurope.com

Part 3
BACnet

Overview

This part contains the following chapters:

Chapter	See page
1 Design guide	3–3
2 Functional specifications	3–15
3 Gateway configuration	3–21
4 Communication procedure	3–33
5 BACnet objects	3–41
6 History	3–45
7 Configuration files	3–47

1 Design guide

1.1 What Is in This Chapter?

Overview

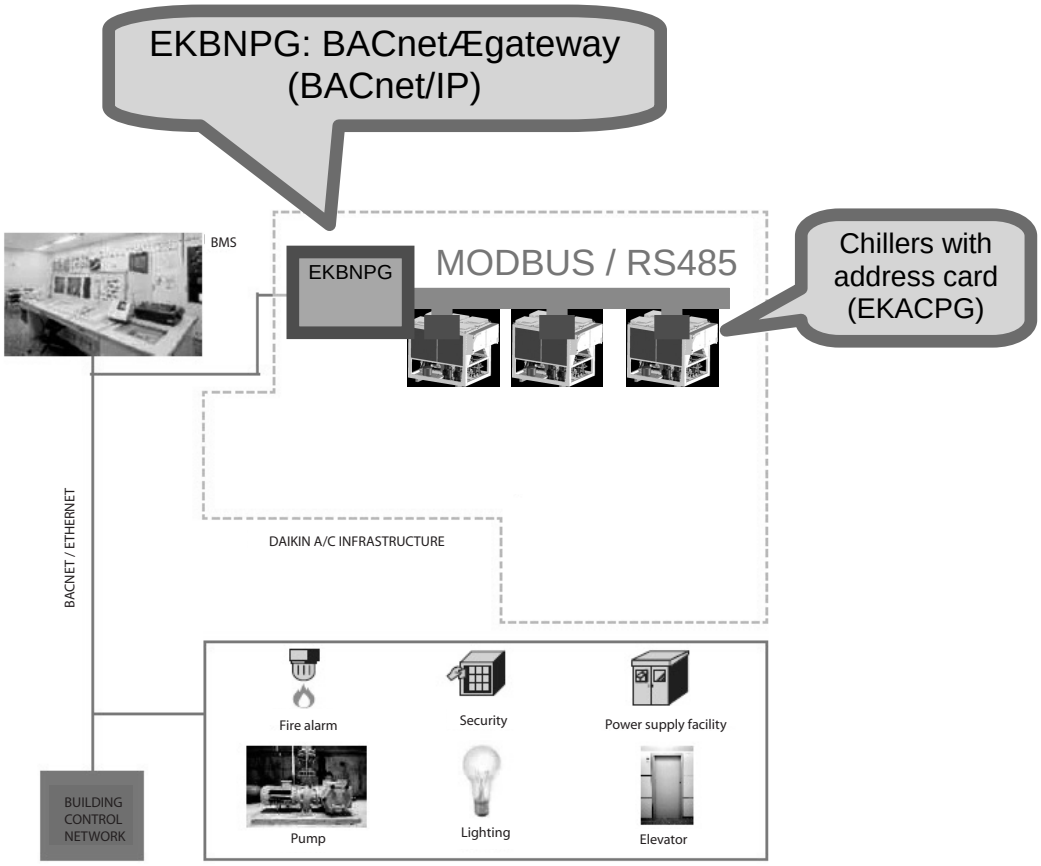
This chapter contains the following topics:

Topic	See page
1.2 Outline and features	3–4
1.3 System outline	3–5
1.4 System configuration	3–6
1.5 Specifications	3–7
1.6 BACnet object list	3–10
1.7 Function	3–13
1.8 Wiring diagram	3–14

1.2 Outline and features

1. Manage the information of up till 8 multiscroll chillers.
2. Objects compatible with BACnet/IP (ANSI/ASHRAE-135a).

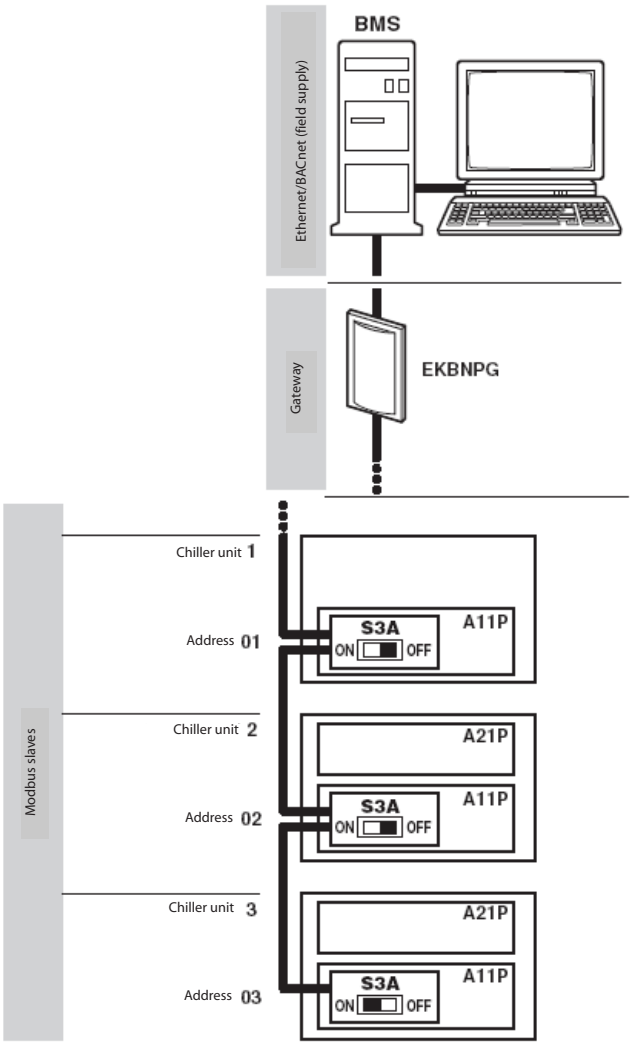
1.3 System outline



Address card	EKACPG	Kit for serial connection on multiscroll chiller

1.4 System configuration

Examples of communication connections

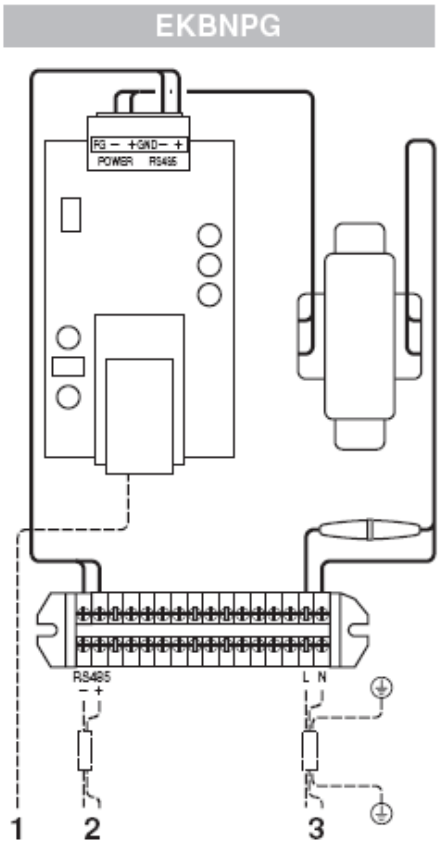


Maximum 8 multiscroll chillers.

1.5 Specifications

BACnet gateway	8 multiscroll chillers per gateway
BACnet transmission	BACnet/IP
Power supply	1~, 230 VAC, +-10% at 50/60Hz
Relative Humidity	5-90%, non-condensing
Operation temperature	-15~60°C
Storage temperature	-20~70°C
Dimensions (HxWxD)	357 x 240 x 78 mm
Power consumption	Max. 5 W
Weight	2.1 kg

Components



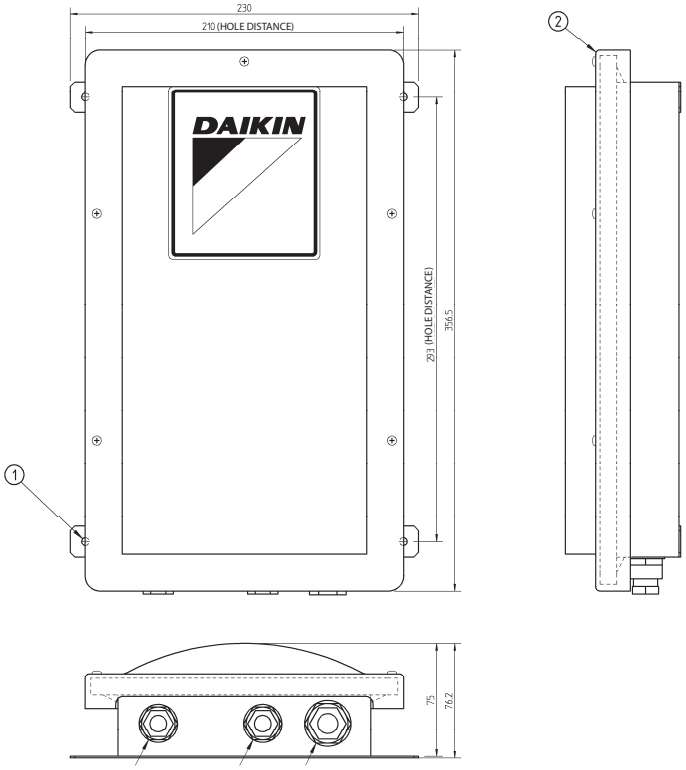
1. Ethernet 10/100 Base-T connection for BACnet/IP communication and for PC configuration
2. RS485 Modbus connection
3. Power supply

3

Accessories

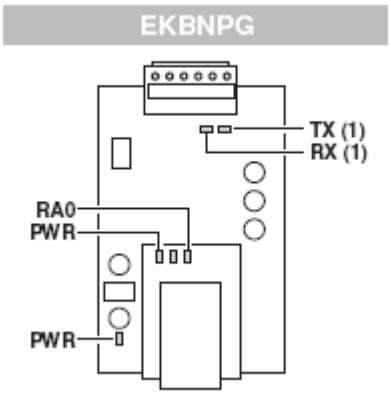
For EKBNPG: BACnet/IP Gateway option box	1x	Screw nut	3x
		Manual	1x

Dimensions



1. 4x hole ∅5 to fix the option box
2. Option box lid

Operation and display signals



LED	Colour	
PWR (2x)	green	Lights up when power is connected
RX (1)	green	Flashes when receiving data via RS485 Modbus
TX (1)	green	Flashes when transmitting data via RS485 Modbus
only for **BACnet/IP Gateway (EKBNPG)**		
RA0	red	Flashes when the PCB is in normal operation

1.6 BACnet object list

BACnet				
Nr	Object Name (string) XXX = Chiller nr	Object Type BO= Binary Output, BI=Binary Input AI=Analog Input AV=Analog Value MI=Multistate Input	Present_Value property:	Additional explanation
1	StartStopStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout status of on/off LED
2	StartStopCommand_XXX	BO	Inactive(0)=Off, Active(1)=On	Control on/off state by pushing on/off button
3	Alarm_XXX	BI	Inactive(0)=Normal, Active(1)=Abnormal	Readout alarm active or not
4	ThermoStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout if thermostat is active or not
5	LowNoiseStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout if low noise mode is active or not
6	FreeCoolingStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout if free cooling is active or not
7	C11CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
8	C12CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
9	C21CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
10	C22CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
11	CoolInletSetpoint_XXX	AV	Degree	Readout and control Cooling inlet setpoint
12	CoolOutletSetpoint_XXX	AV	Degree	Readout and control Cooling outlet setpoint
13	HeatInletSetpoint_XXX	AV	Degree	Readout and control Heating inlet setpoint
14	HeatOutletSetpoint_XXX	AV	Degree	Readout and control Heating outlet setpoint
15	AmbientTemp_XXX	AI	Degree	Readout ambient temp
16	InletTemp_XXX	AI	Degree	Readout inlet temp
17	OutletTemp_XXX	AI	Degree	Readout outlet temp
18	MalfunctionCode_XXX	MI	Refer to “overview of integer values of safety codes”	Readout active safeties Refer to “overview of integer values of safety codes”
19	ModeCoolHeatCommand_XXX	MO	0=COOLING 1=HEATING	Control cooling - heating mode
20	ModeCoolHeatStatus_XXX	MI	0=COOLING 1=HEATING	Readout cooling - heating mode
21	ModeInletOutletCommand_XXX	MO	0= MANUAL CONTROL 1= INL WATER 2= OUTL WATER	Control manual - inlet - outlet mode
22	ModeInletOutletStatus_XXX	MI	0= MANUAL CONTROL 1= INL WATER 2= OUTL WATER	Readout manual - inlet - outlet mode
23	CapacityUnit_XXX	MI	%	Readout capacity of unit

BACnet				
Nr	Object Name (string) XXX = Chiller nr	Object Type BO= Binary Output, BI=Binary Input AI=Analog Input AV=Analog Value MI=Multistate Input	Present_Value property:	Additional explanation
24	CapacityLimitMode_XXX	MO	0=NOT ACTIVE 1=CHANG.DIG.INP. 2=LIMIT 25% or 50% or 75% or SETTING (refer to next variable)	Readout and control capacity limitation setting of unit
25	CapacityLimitModeSel_XXX	MO	0=LIMIT 25% 1=LIMIT 50% 2=LIMIT 75% 3=LIMIT SETTING	
26	LowNoiseMode_XXX	MO	0= NOT ACTIVE 1= CHANG.DIG.INP. 2= DAILY SCHEDULE 3= ACTIVE	Readout and control Low noise mode setting
27	C11Status_XXX	MI	0= CAN STARTUP 1= NO PRIORITY 2= NO FLOW 3= PUMPLEAD TIM 4= TIMER BUSY 5= FREE COOLING 6= AREC INLET 7= UNIT OFF 8= STANDBY DICN 9= LIMIT 10= MIN.RUN.TIM 11= HP SETBACK 12= COMP PR 13= DEFROST BUSY 14= FREEZEUP PR 15= FREEZEUP DIS 16= SAFETY ACT.	Readout compressor status
28	C12Status_XXX	MI		
29	C21Status_XXX	MI		
30	C22Status_XXX	MI		
31	FanC1Status_XXX	MI	0 = Off, 1= LLLL, 2= LLL, 3= LL, 4=Low, 5=Medium, 6=High For OPIF: %	Readout fan status
32	FanC2Status_XXX	MI		

3

Overview integer values of safety codes

@difference between softcopy input files (installation manual) and print-out@

Value		Message safety menu
0	UNIT SAFETY	No safety
1	UNIT SAFETY	"0F0:EMERGENCY STOP"
2	UNIT SAFETY	"0AE:FLOW HAS STOPPED"
4	UNIT SAFETY	"0C9:INL SENSOR ERR"
5	UNIT SAFETY	"0CA:OUT SENSOR ERR"
6	UNIT SAFETY	"0H9:AMB T SENSOR ERR"
9	UNIT SAFETY	"0U4:EXT PCB COMM.ERR"
10	UNIT SAFETY	"0U4:MAINPCB COMM.ERR"
12	UNIT SAFETY	"0AE:PUMPINTERLOCK"
14	UNIT WARNING	"0AE:FLOW HAS STOPPED"
16	UNIT WARNING	"0C9:INL SENSOR ERR"
17	UNIT SAFETY	"0A9:EEV PCB COMM ERR"
18	UNIT SAFETY	"0A9:EEV PCB ERR"
19	UNIT SAFETY	"0UA:OP.NOT CONFIRMED"
29	UNIT SAFETY	"0U5:PCB COMM.PROBLEM"
30	CIRCUIT 1 SAFETY	"1U1:REV PHASE PROT"
31	CIRCUIT 1 SAFETY	"1E3:HIGH PRESSURE SW"
35	CIRCUIT 1 SAFETY	"1E4:LOW PRESSURE"
37	CIRCUIT 1 SAFETY	"1JA:HP SENSOR ERR"
38	CIRCUIT 1 SAFETY	"1JC:LP SENSOR ERR"
42	CIRCUIT 1 SAFETY	"153:FAN INV ERR."
44	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR1"
45	CIRCUIT 1 SAFETY	"1F3:HIGH DISCH TEMP1"
46	UNIT WARNING	"153:FAN OVERC. ST1"
47	UNIT WARNING	"153:FAN OVERC. ST2"
48	UNIT WARNING	"153:FAN OVERC. ST3"
49	CIRCUIT 1 SAFETY	"1A9:EEV ERR"
50	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST1"
51	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST2"
52	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST3"
53	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERR"
54	CIRCUIT 1 SAFETY	"1A9:SUPERHEAT ERR"
56	UNIT WARNING	"1E3:HP SETBACK"
57	UNIT WARNING	"1E6:COMP PR"
58	CIRCUIT 1 SAFETY	"1E6:COMPR 1 SAFETY"
59	CIRCUIT 1 SAFETY	"1E6:COMPR 2 SAFETY"
60	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR2"
61	CIRCUIT 1 SAFETY	"1F3:HIGH DICH TEMP2"

Value		Message safety menu
62	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH1"
63	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH2"
64	UNIT WARNING	"1J6:COIL1 SENSOR ERR"
65	UNIT WARNING	"1J7:COIL2 SENSOR ERR"
66	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
67	UNIT SAFETY	"0A4:FREEZE UP C1"
70	CIRCUIT 2 SAFETY	"1U1:REV PHASE PROT"
71	CIRCUIT 2 SAFETY	"1E3:HIGH PRESSURE SW"
75	CIRCUIT 2 SAFETY	"1E4:LOW PRESSURE"
77	CIRCUIT 2 SAFETY	"1JA:HP SENSOR ERR"
78	CIRCUIT 2 SAFETY	"1JC:LP SENSOR ERR"
82	CIRCUIT 2 SAFETY	"153:FAN INV ERR."
84	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR1"
85	CIRCUIT 2 SAFETY	"1F3:HIGH DISCH TEMP1"
86	UNIT WARNING	"253:FAN OVERC. ST1"
87	UNIT WARNING	"253:FAN OVERC. ST2"
88	UNIT WARNING	"253:FAN OVERC. ST3"
89	CIRCUIT 2 SAFETY	"1A9:EEV ERR"
90	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST1"
91	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST2"
92	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST3"
93	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERR"
94	CIRCUIT 2 SAFETY	"1A9:SUPERHEAT ERR"
96	UNIT WARNING	"2E3:HP SETBACK"
97	UNIT WARNING	"2E6:COMP PR"
98	CIRCUIT 2 SAFETY	"1E6:COMPR 1 SAFETY"
99	CIRCUIT 2 SAFETY	"1E6:COMPR 2 SAFETY"
100	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR2"
101	CIRCUIT 2 SAFETY	"1F3:HIGH DICH TEMP2"
102	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH1"
103	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH2"
104	UNIT WARNING	"2J6:COIL1 SENSOR ERR"
105	UNIT WARNING	"2J7:COIL2 SENSOR ERR"
106	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
107	UNIT SAFETY	"0A4:FREEZE UP C2"
190	NETWORK SAFETY	"0U4:PCB COMM.PROBLEM"
191	NETWORK SAFETY	"0CA:OUT E SENSOR ERR"
192	NETWORK SAFETY	"0C9:INL E SENSOR ERR"
194	NETWORK SAFETY	"0U4:SW VERSION ERR"

1.7 Function

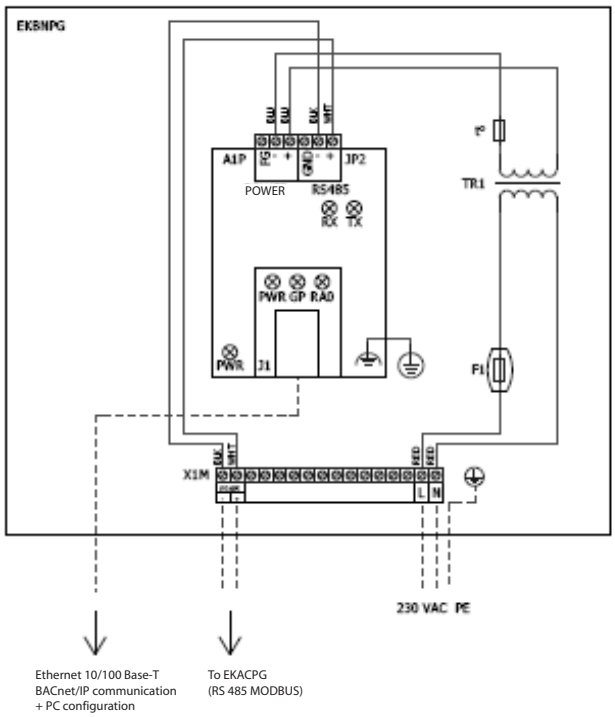
Main functions

Functions	EKBNPG: BACnet/IP gateway
Monitor and control:	
On-Off	O
Thermostat setpoints	O
Cooling/heating mode	O
Capacity limitation	O
Low noise mode (only OPIF)	O
Monitor:	
Error (active/not active, code) of highest priority active error	O
Inlet, outlet sensor temperature	O
Unitcapacity	O
Compressor On/Off status, fan status	O

O= function possible

1.8 Wiring diagram

A1P	Printed circuit board
F1	Fuse (1A)
TR1	Power supply transformer (230 V / 21.8 V)
X1M	Terminal strip



For external wiring:

Connect cables according to specifications in the table below.

Connection to	
Configuration PC	In case of communication via hub, use a ethernet 10/100 Base-T straight cable (field supply). In case of direct communication use a ethernet 10/100 Base-T cross cable (field supply).
BACnet/IP communication	
RS485 Modbus connection	Use a 0.75~1.25 mm^2 2-wire cable of maximum 500 m measured from gateway to last unit in line (+/- polarity).
Power supply	Use a 1.5 mm^2 2-wire + earth cable and perform grounding.

2 Functional specifications

2.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

Topic	See page
2.2 Summary	3–16
2.3 BACnet Protocol Implementation Conformance Statement (PICS)	3–17

2.2 Summary

The BACnet gateway enables interfacing between the chiller unit and the BMS (Building Management System).

Units installed in such configuration can be monitored and operated on the BMS through BACnet/IP communication.

2.3 BACnet Protocol Implementation Conformance Statement (PICS)

Following statement is the general statement from the PCB supplier. Meaning only the BACnet/IP related items are valid.

Driver Version: 1.15

Document Revision: 9

FieldServer Driver - BACnet Protocol Implementation Conformance Statement

BACnet Protocol

Date:	September 9, 2005
Vendor Name:	FieldServer Technologies
Product Name:	FieldServer
Product Model Number:	FS-B40, FS-B20 or FS-B30 Series ProtoCessor FFP SlotServer
Product Description:	This software product will provide bi-directional communication between various RTU, DCS, SCADA and PLC using most common protocols and a BACnet system. The FieldServer can perform protocol conversion (as opposed to routing) between the different BACnet Data Link Layer options. This is arranged by way of static mappings.
Protocol Conversions:	See FieldServer Technologies list of protocol drivers available to determine available protocol conversions.

BACnet Standardized Device Profile (Annex L) - [Note that the FieldServer is a gateway device]:

- v BACnet Smart Sensor (B-SS)
- v BACnet Smart Actuator (B-SA)

BACnet Interoperability Building Blocks Supported (Annex K):

- v K.1.1 BIBB - Data Sharing - ReadProperty-A (DS-RP-A)
- v K.1.2 BIBB - Data Sharing - ReadProperty-B (DS-RP-B)
- v K.1.3 BIBB - Data Sharing - ReadPropertyMultiple-A (DS-RPM-A) (except ProtoCessor-FFP)
- v K.1.4 BIBB - Data Sharing - ReadPropertyMultiple-B (DS-RPM-B) (except ProtoCessor-FFP)
- v K.1.7 BIBB - Data Sharing - WriteProperty-A (DS-WP-A)
- v K.1.8 BIBB - Data Sharing - WriteProperty-B (DS-WP-B)
- v K.1.12 BIBB - Data Sharing - COV-B (DS-COV-B)
- v K.2.2 BIBB - Alarm and Event-Notification Internal-B (AE-N-I-B)
- v K.5.1 BIBB - Device Management - Dynamic Device Binding-A (DM-DDB-A)

- v K.5.2 BIBB - Device Management - Dynamic Device Binding-B (DM-DDB-B)
- v K.5.3 BIBB - Device Management - Dynamic Device Binding-A (DM-DOB-A)
- v K.5.4 BIBB - Device Management - Dynamic Device Binding-B (DM-DOB-B)

Segmentation Capability:

None

Standard Object Types Supported:

- v Device Object
- v Analog Input
- v Analog Output
- v Analog Value
- v Binary Input
- v Binary Output
- v Binary Value
- v Multi State Input Output
- v Multi State Output
- v Multi State Value
- v Notification Class Object

For all these properties the following apply:

1. Does not support BACnet CreateObject
2. Does not support BACnet DeleteObject
3. Does not support any optional properties
4. No additional writeable properties exist
5. No proprietary properties exist
6. No range restrictions exist
7. Client Driver can only read Present Value property

Data Link Layer Options:

- v BACnet IP, (Annex J)
- v ANSI/ATA 878.1, 2.5 Mb, ARCNET (Clause 8)
- v Point-to-point, EIA 232 (Clause 10), baudrate up to 57.6 kbps
- v ISO 8802-3, Ethernet (Clause 7)
- v MS/TP master (Clause 9), baudrate up to 57.6 kbps
- v MS/TP slave (Clause 9), baudrate up to 57.6 kbps

Device Address Binding:

Not supported

Networking Options:

x Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.

x Annex H, BACnet Tunneling Router over IP

v BACnet/IP Broadcast Management Device (BBMD)

v Registrations by Foreign Devices

3 Gateway configuration

3.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

Topic	See page
3.2 Configuration file	3–22
3.3 Downloading the configuration file to the gateway	3–24

3.2 Configuration file

The configuration files should be available on the DENV extranet (Service department).

3

Number of connected chillers

Select the file based on the number of units that will be connected to the gateway.

Nr of units connected to gateway	LON configuration file
1	configLON_PC_Daikin_1unit_v0_6.csv
2	configLON_PC_Daikin_2units_v0_6.csv
...	
8	configLON_PC_Daikin_8units_v0_6.csv

Modbus address

Modbus address is defined in the configuration file. The Modbus address can be modified as follows:

Node_ID	Modbus address	Default: 01, 02, 03, ... 08 (depending on nr of units) Range: 01 ... 32

Example: configBN_PC_Daikin_1unit_v0_6.csv

```
//===============================================================================
//
// Client Side Nodes
//
Nodes
Node_Name, Node_ID, Protocol, Port
PLC_01,01, Modbus_RTU, S1
```

Example: configBN_PC_Daikin_8units_v0_6.csv

```
//===============================================================================
//
// Client Side Nodes
//
Nodes
Node_Name, Node_ID, Protocol, Port
PLC_01, 01, Modbus_RTU, S1
PLC_02, 02, Modbus_RTU, S1
PLC_03, 03, Modbus_RTU, S1
PLC_04, 04, Modbus_RTU, S1
PLC_05, 05, Modbus_RTU, S1
PLC_06, 06, Modbus_RTU, S1
PLC_07, 07, Modbus_RTU, S1
PLC_08, 08, Modbus_RTU, S1
```

BACnet MAC address and network address (BACnet gateway only)

The BACnet address is defined in the configuration file. The BACnet address can be modified as follows:

System_Node_id	BACnet MAC address	Default: 11 Range: 1 - 16777215
Network_number	BACnet network address	Default: 5 Range: 1 - 255

Example: configBN_PC_Daikin_1unit_v0_8.csv

```
//===============================================================================
//
// Common Information
//

Bridge
Title, System_Node_Id, Network_number
CN00241 Daikin 8 units v0.8, 11, 5
```

BACnet device address (BACnet gateway only)

The BACnet address is defined in the configuration file. The BACnet address can be modified as follows:

Node_ID	BACnet address	Default: 11, 12, 13, ... 18 (depending on nr of units) Range: 1 - 16777215

Example: configBN_PC_Daikin_1unit_v0_6.csv

```
//===============================================================================
//
// Server Side Nodes
//
Nodes
Node_Name, Node_ID, Protocol
Virtual_BCU_11, 11, Bacnet_IP
```

Example: configBN_PC_Daikin_8units_v0_6.csv

```
//===============================================================================
//
// Server Side Nodes
//
Nodes
Node_Name, Node_ID, Protocol
Virtual_BCU_11, 11, Bacnet_IP
Virtual_BCU_12, 12, Bacnet_IP
Virtual_BCU_13, 13, Bacnet_IP
Virtual_BCU_14, 14, Bacnet_IP
Virtual_BCU_15, 15, Bacnet_IP
Virtual_BCU_16, 16, Bacnet_IP
Virtual_BCU_17, 17, Bacnet_IP
Virtual_BCU_18, 18, Bacnet_IP
```

3.3 Downloading the configuration file to the gateway

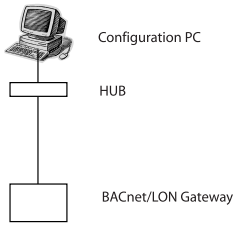
Overview hardware/software/ setup

The software should be available on the DENV extranet (Service department)

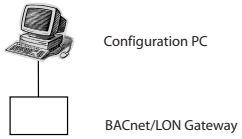
Software	“Remote user interface” (ruinet.exe) “Ping utility” (ruiping.exe)	These programs are the result after installing “Install.zip” Install.zip can be downloaded from the internet http://www.protocessor.com/tech_support/utilities.html

Hardware setup:

1. via hub

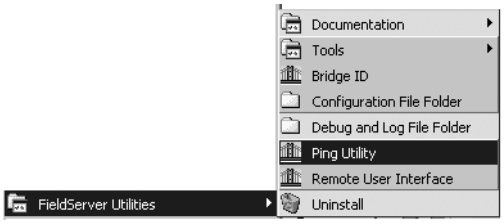
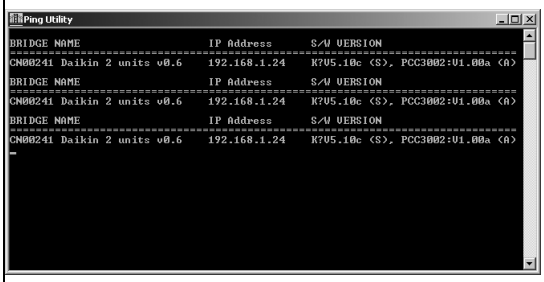


2. via Ethernet cross-over cable

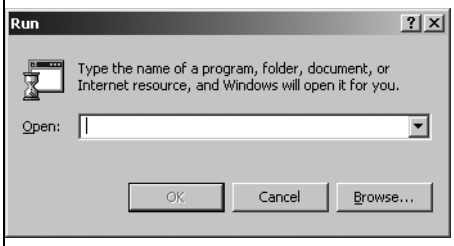


Download process

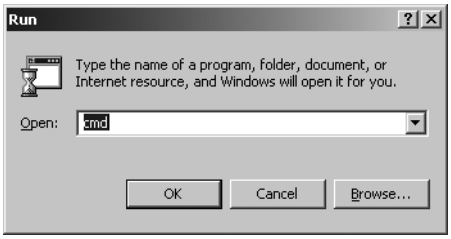
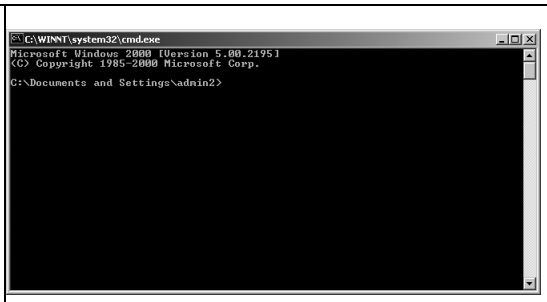
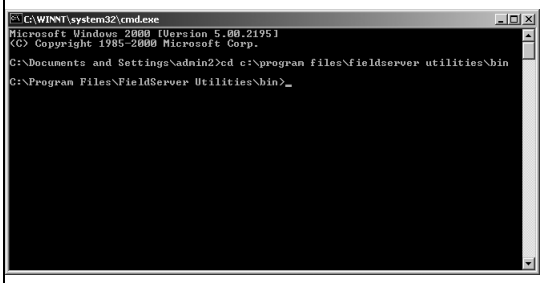
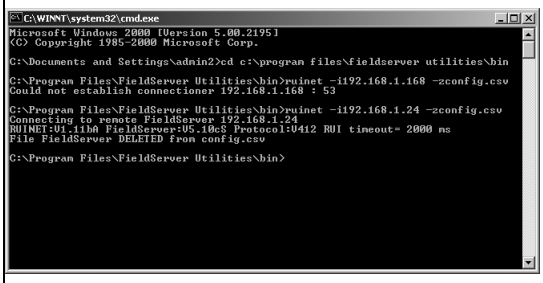
Step1: Identification of the IP number of the gateway => use ping utility

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > ping utility: Start “Ping utility” (ruiping.exe) 	The display should show:  If it does not (even after repeated attempts) then either the network cabling is incorrect or the computer network card is faulty or incorrectly configured. ■ Check the Ethernet link OK led. ■ Check the “activity” led on the ethernet connection, this should flash at least once every 2 seconds if rui is still running, and perhaps more often, depending on the network traffic. ■ Check that the IP address of the PC is within the same network (192.168.1.xxx) of the gateway. The default IP address of the gateway is 192.168.1.24, submask is 255.255.255.0. ■ Confirm that there is an ethernet adapter installed in the PC’s device manager list, and that it is configured to run the TCP/IP protocol. ■ If using Windows XP, ensure that the firewall is disabled.

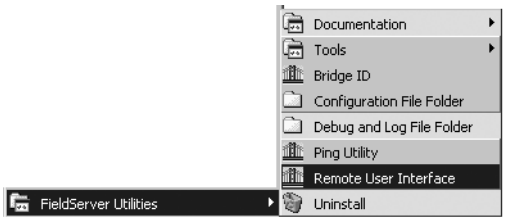
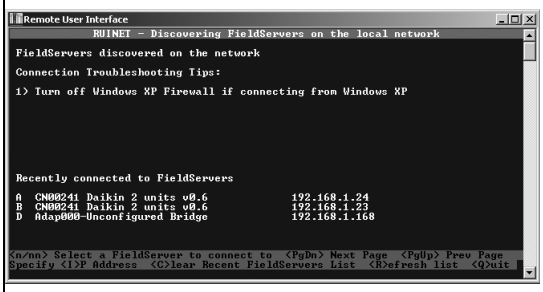
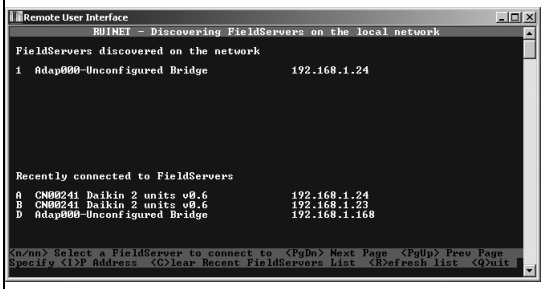
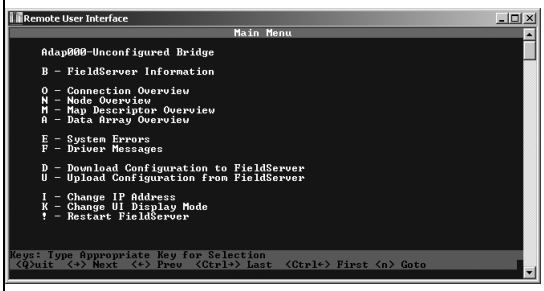
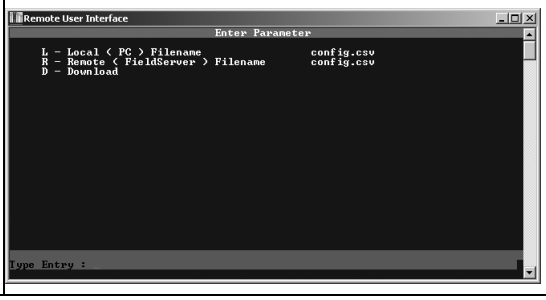
Step2: Make the gateway empty

Action	Result
1. Go to “START” Click on “run...” 	

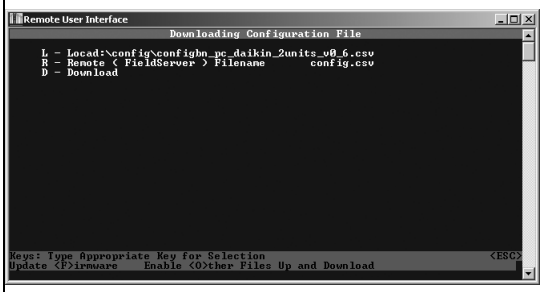
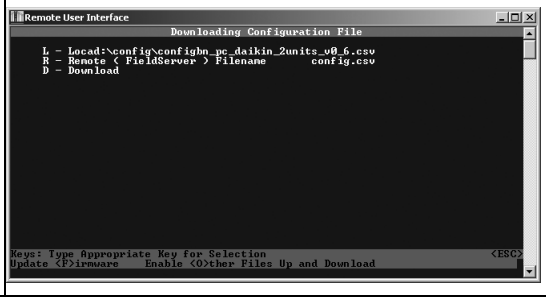
3

2. Now type “cmd” into the window  Press “enter”	
3. Type (e.g. Depending on installation directory) “cd c:\program files\fieldserver utilities\bin” + enter	After a few seconds you get this window 
4. Type “ruinet -i192.168.1.24 -zconfig.csv” + enter (Remark: IP address should be equal to the IP gateway address)	
5. Switch the power off and on to reset the gateway	

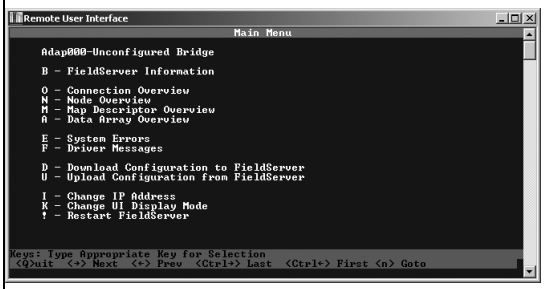
Step3: Connect to the gateway (ruinet)

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > Remote User Interface  Documentation Tools Bridge ID Configuration File Folder Debug and Log File Folder Ping Utility Remote User Interface Uninstall FieldServer Utilities	The display should show:  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network Connection Troubleshooting Tips: 1) Turn off Windows XP Firewall if connecting from Windows XP Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit When the gateway is discovered. (Remark: after power up the gateway this can take up to 90 sec)  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network 1 Adap000-Unconfigured Bridge 192.168.1.24 Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit
2. Press the item of the discovered gateway. In this case press “1”	 Remote User Interface Main Menu Adap000-Unconfigured Bridge B - FieldServer Information O - Connection Overview N - Node Overview M - Map Descriptor Overview A - Data Array Overview E - System Errors F - Driver Messages D - Download Configuration to FieldServer U - Upload Configuration from FieldServer I - Change IP Address K - Change UI Display Mode ! - Restart FieldServer Keys: Type Appropriate Key for Selection <Q>uit <+> Next <-> Prev <Ctrl+> Last <Ctrl+> First <n> Goto
3. Press “D” to enter the download configuration menu	Remote User Interface Downloading Configuration File L - Local (PC) Filename config.csv R - Remote (FieldServer) Filename config.csv D - Download Keys: Type Appropriate Key for Selection <ESC> Update <F>irmware Enable <O>ther Files Up and Download
4. Press “L” to enter the configuration file name	 Remote User Interface Enter Parameter L - Local (PC) Filename config.csv R - Remote (FieldServer) Filename config.csv D - Download Type Entry :

3

5. Type the configuration file name (including drive + directory) Example: “d:\config\configbn_pc_daikin_2units_v0_6.csv”	
6. Press “enter”	If file exist the file is shown on screen 
7. Press “D”	Download starts At the end following message is displayed:
8. Press any key to continue	

9. Press “ESC” to go back to main menu


Remote User Interface
Main Menu
Adap000-Unconfigured Bridge
B - FieldServer Information
Q - Connection Overview
N - Node Overview
M - Map Descriptor Overview
A - Data Array Overview
E - System Errors
F - Driver Messages
D - Download Configuration to FieldServer
U - Upload Configuration from FieldServer
I - Change IP Address
K - Change UI Display Mode
! - Restart FieldServer
Keys: Type Appropriate Key for Selection
<Q>uit <→> Next <←> Prev <Ctrl→> Last <Ctrl←> First <n> Goto

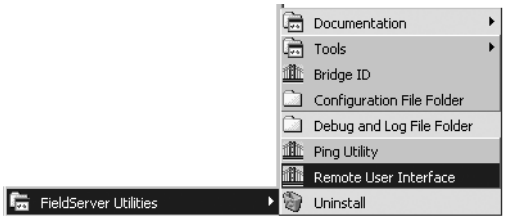
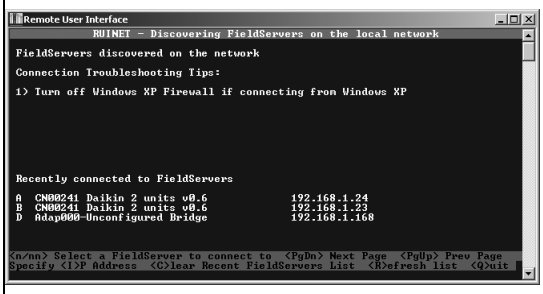
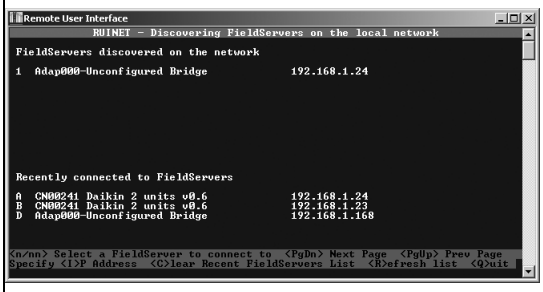
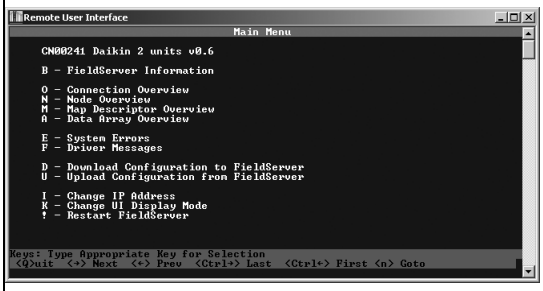
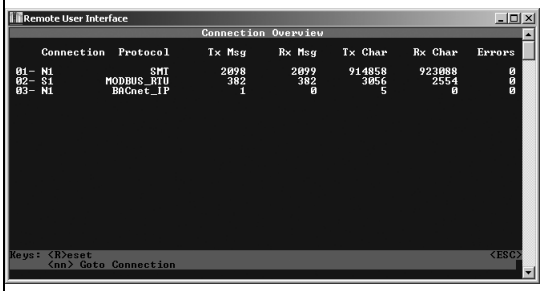
10. Press “!” to restart gateway

If restart is successful the main menu with the down-loaded configuration file is shown.

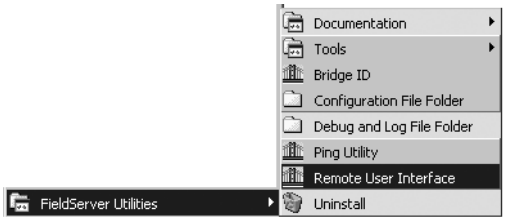
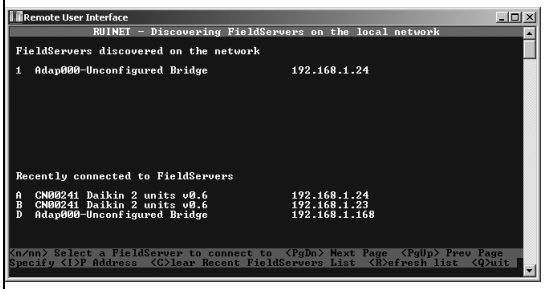
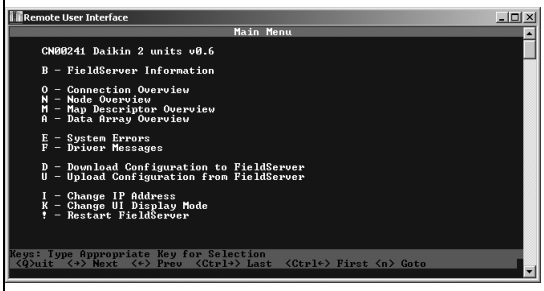
Remote User Interface
Main Menu
CN00241 Daikin 2 units v0.6
B - FieldServer Information
Q - Connection Overview
N - Node Overview
M - Map Descriptor Overview
A - Data Array Overview
E - System Errors
F - Driver Messages
D - Download Configuration to FieldServer
U - Upload Configuration from FieldServer
I - Change IP Address
K - Change UI Display Mode
! - Restart FieldServer
Keys: Type Appropriate Key for Selection
<Q>uit <→> Next <←> Prev <Ctrl→> Last <Ctrl←> First <n> Goto

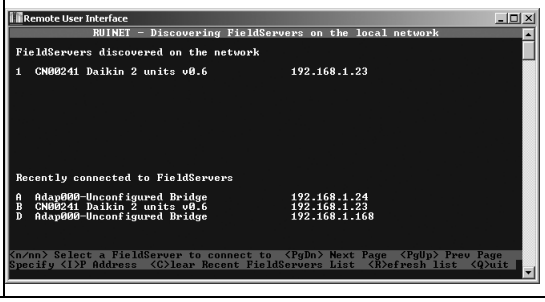
3

Monitor communication

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > Remote User Interface 	The display should show:  When the gateway is discovered. (Remark: after power up the gateway this can take up to 90 sec) 
2. Press the item of the discovered gateway. In this case press “1”	
3. Press “O”	 The communication can be consulted: SMT: the internal gateway functionality Modbus: the modbus communication BACnet_IP: the BACnet communication

Change IP address

Action	Result
1. Go to “START” > “Programs” > fieldserver utilities > Remote User Interface  Documentation Tools Bridge ID Configuration File Folder Debug and Log File Folder Ping Utility Remote User Interface FieldServer Utilities Uninstall	The display should show: Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network Connection Troubleshooting Tips: 1) Turn off Windows XP Firewall if connecting from Windows XP Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit When the gateway is discovered. (Remark: after power up the gateway this can take up to 90 sec)  Remote User Interface RUINET - Discovering FieldServers on the local network FieldServers discovered on the network 1 Adap000-Unconfigured Bridge 192.168.1.24 Recently connected to FieldServers A CN00241 Daikin 2 units v0.6 192.168.1.24 B CN00241 Daikin 2 units v0.6 192.168.1.23 D Adap000-Unconfigured Bridge 192.168.1.168 <n/nn> Select a FieldServer to connect to <PgDn> Next Page <PgUp> Prev Page Specify <I>P Address <C>lear Recent FieldServers List <R>efresh list <Q>uit
2. Press the item of the discovered gateway. In this case press “1”	 Remote User Interface Main Menu CN00241 Daikin 2 units v0.6 B - FieldServer Information O - Connection Overview N - Node Overview M - Map Descriptor Overview A - Data Array Overview E - System Errors F - Driver Messages D - Download Configuration to FieldServer U - Upload Configuration from FieldServer I - Change IP Address K - Change UI Display Mode ! - Restart FieldServer Keys: Type Appropriate Key for Selection <Q>uit <+> Next <-> Prev <Ctrl+> Last <Ctrl+> First <n> Goto
3. Press “I”	Remote User Interface Edit IP Address Settings 1 - N1 IP Address 192.168.1.24 2 - N1 Netmask 255.255.255.0 3 - N1 Gateway 1 192.168.1.1 4 - N1 DHCP Client State DISABLED 5 - N1 DHCP Server State DISABLED Keys: Type Appropriate Key for Selection <ESC>
4. Press “1” and enter new IP address Example 192.168.1.23	Remote User Interface Enter Parameter 1 - N1 IP Address 192.168.1.24 2 - N1 Netmask 255.255.255.0 3 - N1 Gateway 1 192.168.1.1 4 - N1 DHCP Client State DISABLED 5 - N1 DHCP Server State DISABLED Changes only become active once the FieldServer has been restarted. Press any key to continue. Type Entry : 192.168.1.23
5. Close the “remote user interface” push “End now” if requested	

6. Switch to power off and on of the gateway	
7. Restart Remote User Interface	

4 Communication procedure

4.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

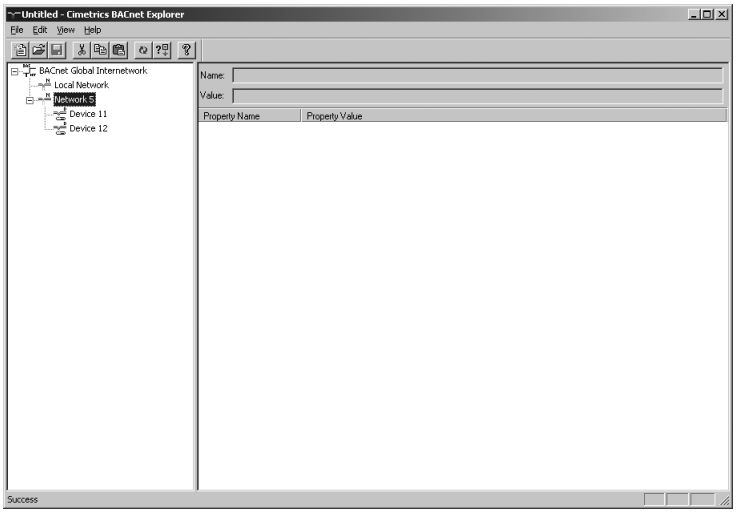
Topic	See page
4.2 Cimetrics BACnet explorer	3–34
4.3 CAS BACnet explorer	3–34

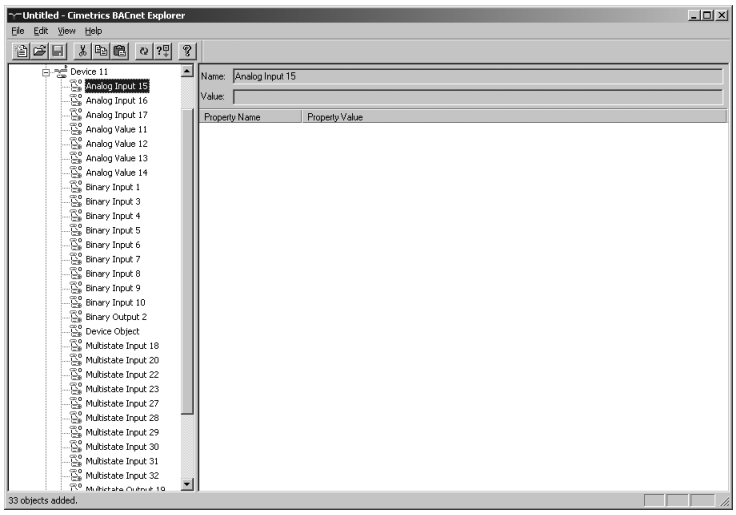
4.2 Cimetrics BACnet explorer

The software should be available on the DENV extranet (Service department).

For procedure how to install and startup the BACnet explorer refer to VRV BACnet service manual (Si72-304).

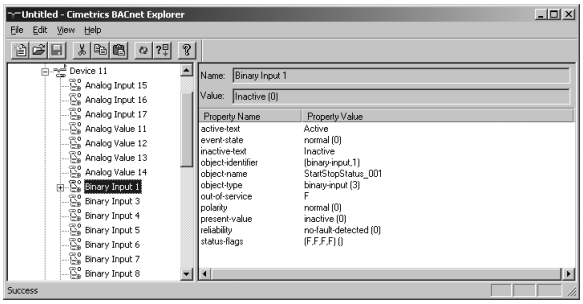
Example 1: Discovered devices 11 & 12 on network 5 (double click local network).



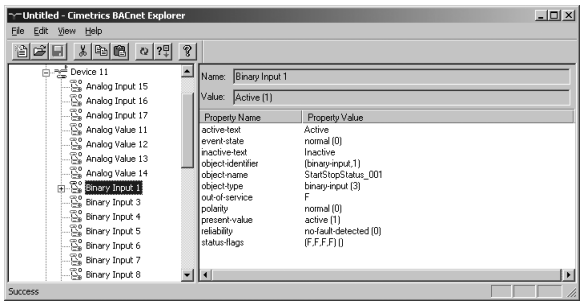


Example 2: StartStopStatus_001 (BI).

When unit is off (present_value = inactive (0)).

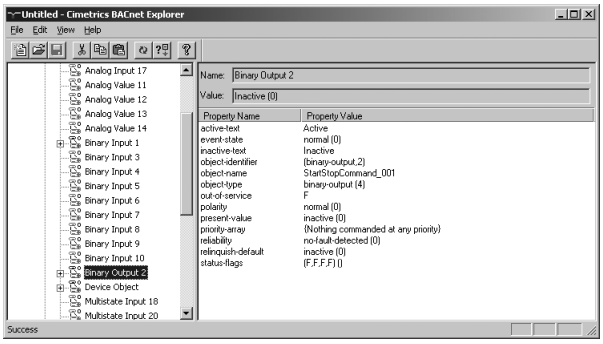


When unit is on (present_value = active (1)).

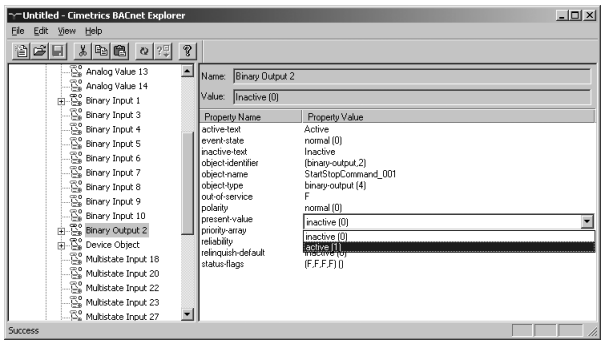


Example 3: StartStopCommand_001 (BO).

(Remark: In Cimetrics BACnet explorer only the switch from off to on works. The switch from on to off does not work due to Cimetrics BACnet explorer).



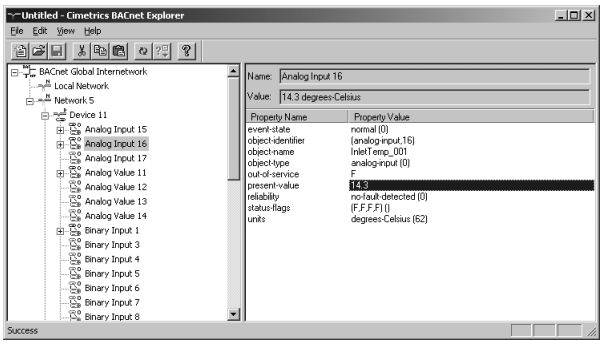
To switch unit on, push present-value and modify to active (1).



Result: unit will be turned on.

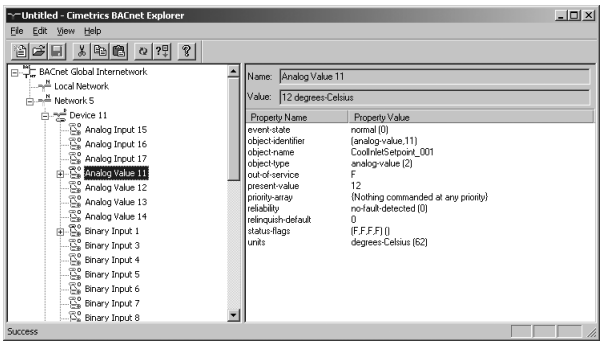
Example 4: InletTemp_001 (AI).

Monitor inlet water temperature: present-value is 14.3°C.

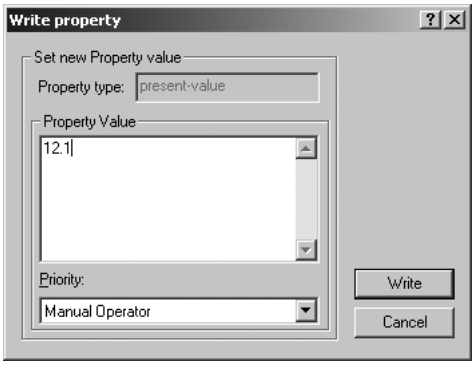


Example 5: CoolInletSetpoint_001 (AV).

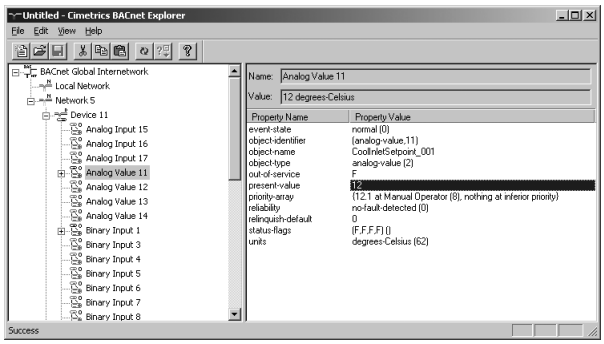
Monitor cooling inlet setpoint: present-value is 12.0°C.



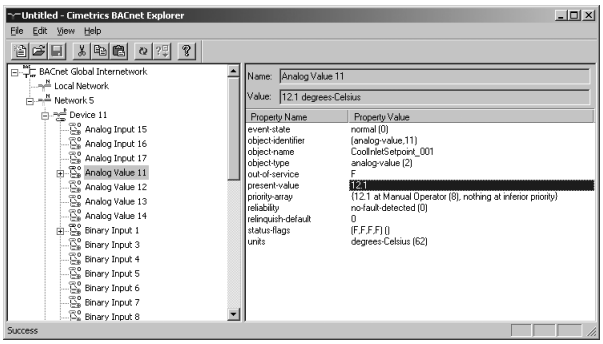
To modify setpoint, push present-value enter new setpoint (example 12.1) and push write.



Result:

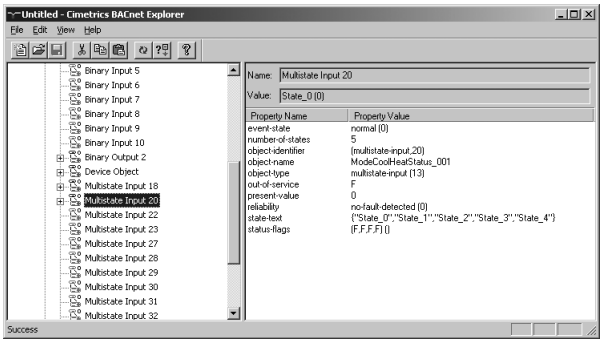


The setpoint will be modified after certain time (seconds), push reload to see active value.



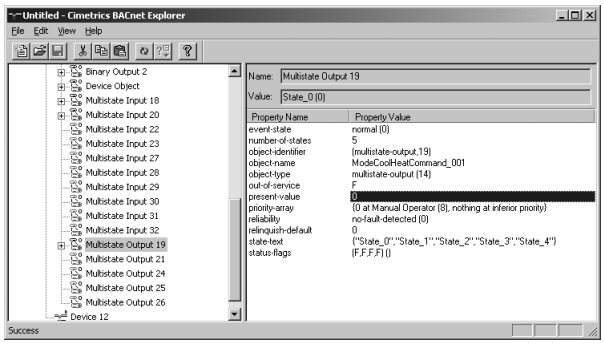
Example 6: ModeCoolHeatStatus_001 (MI).

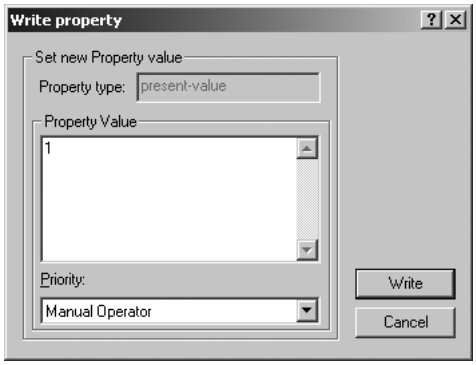
Monitor Cooling-Heating status: present-value is 0 means cooling.



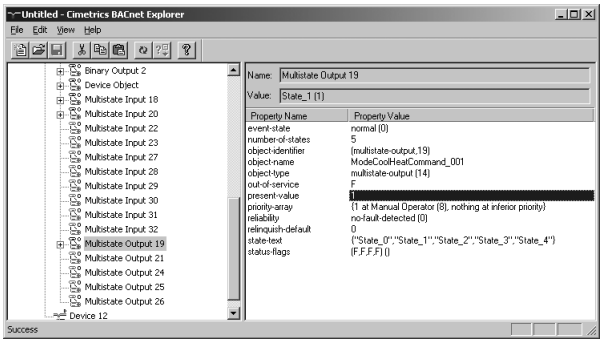
Example 7: ModeCoolHeatCommand_001 (MO).

To modify cooling-heating mode, push present-value enter new setpoint (example 1 means heating) and push write.





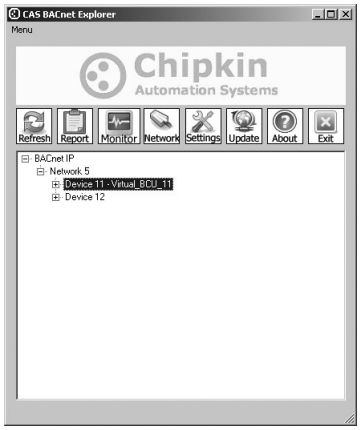
Result:


Untitled - Cimetrics BACnet Explorer
File Edit View Help
Binary Output 2
Device Object
Multistate Input 18
Multistate Input 20
Multistate Input 22
Multistate Input 23
Multistate Input 27
Multistate Input 28
Multistate Input 29
Multistate Input 30
Multistate Input 31
Multistate Input 32
Multistate Output 19
Multistate Output 21
Multistate Output 24
Multistate Output 25
Multistate Output 26
Device 12
Name: Multistate Output 19
Value: State_1 (1)
Property Name
Property Value
event-state
normal (0)
number-of-states
5
object-identifier
(multistate-output,19)
object-name
ModeCoolHeatCommand_001
object-type
multistate-output (14)
out-of-service
F
present-value
1
priority-array
(1 at Manual Operator (8), nothing at inferior priority)
reliability
no-fault-detected (0)
relinquish-default
0
state-text
("State_0","State_1","State_2","State_3","State_4")
status-flags
(F,F,F,F) ()
Success

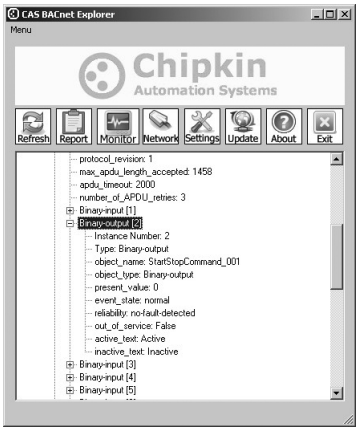
3

4.3 CAS BACnet explorer

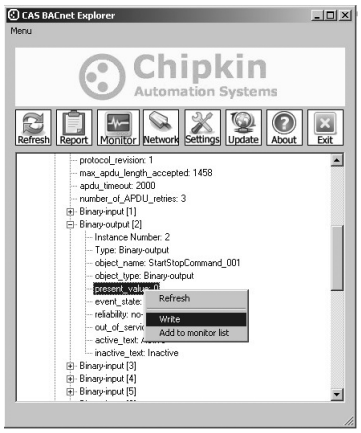
Example 1: Discovered devices 11 & 12 on network 5 (double BACnet IP, Network x).



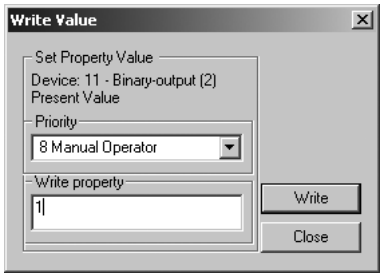
Example 2: StartStopCommand_001 (BO).



To switch unit on, right click on present_value and select write.



Write 1 to switch on (write 0 to switch off).



3

5 BACnet objects

The following table contains an overview of the possible BACnet objects.

BACnet				
Nr	Object Name (string) XXX = Chiller nr	Object Type BO= Binary Output, BI=Binary Input AI=Analog Input AV=Analog Value MI=Multistate Input	Present_Value property:	Additional explanation
1	StartStopStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout status of on/off LED
2	StartStopCommand_XXX	BO	Inactive(0)=Off, Active(1)=On	Control on/off state by pushing on/off button
3	Alarm_XXX	BI	Inactive(0)=Normal, Active(1)=Abnormal	Readout alarm active or not
4	ThermoStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout if thermostat is active or not
5	LowNoiseStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout if low noise mode is active or not
6	FreeCoolingStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout if free cooling is active or not
7	C11CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
8	C12CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
9	C21CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
10	C22CompressorStatus_XXX	BI	Inactive(0)=Off, Active(1)=On	Readout compressor status
11	CoolInletSetpoint_XXX	AV	Degree	Readout and control Cooling inlet setpoint
12	CoolOutletSetpoint_XXX	AV	Degree	Readout and control Cooling outlet setpoint
13	HeatInletSetpoint_XXX	AV	Degree	Readout and control Heating inlet setpoint
14	HeatOutletSetpoint_XXX	AV	Degree	Readout and control Heating outlet setpoint
15	AmbientTemp_XXX	AI	Degree	Readout ambient temp
16	InletTemp_XXX	AI	Degree	Readout inlet temp
17	OutletTemp_XXX	AI	Degree	Readout outlet temp
18	MalfunctionCode_XXX	MI	Refer to “overview of integer values of safety codes”	Readout active safeties Refer to “overview of integer values of safety codes”
19	ModeCoolHeatCommand_XXX	MO	0=COOLING 1=HEATING	Control cooling - heating mode
20	ModeCoolHeatStatus_XXX	MI	0=COOLING 1=HEATING	Readout cooling - heating mode
21	ModeInletOutletCommand_XXX	MO	0= MANUAL CONTROL 1= INL WATER 2= OUTL WATER	Control manual - inlet - outlet mode

BACnet				
Nr	Object Name (string) XXX = Chiller nr	Object Type BO= Binary Output, BI=Binary Input AI=Analog Input AV=Analog Value MI=Multistate Input	Present_Value property:	Additional explanation
22	ModeInletOutletStatus_XXX	MI	0= MANUAL CONTROL 1= INL WATER 2= OUTL WATER	Readout manual - inlet - outlet mode
23	CapacityUnit_XXX	MI	%	Readout capacity of unit
24	CapacityLimitMode_XXX	MO	0=NOT ACTIVE 1=CHANG.DIG.INP. 2=LIMIT 25% or 50% or 75% or SETTING (refer to next variable)	Readout and control capacity limitation setting of unit
25	CapacityLimitModeSel_XXX	MO	0=LIMIT 25% 1=LIMIT 50% 2=LIMIT 75% 3=LIMIT SETTING	
26	LowNoiseMode_XXX	MO	0= NOT ACTIVE 1= CHANG.DIG.INP. 2= DAILY SCHEDULE 3= ACTIVE	Readout and control Low noise mode setting
27	C11Status_XXX	MI	0= CAN STARTUP 1= NO PRIORITY 2= NO FLOW 3= PUMPLEAD TIM 4= TIMER BUSY 5= FREE COOLING 6= AREC INLET 7= UNIT OFF 8= STANDBY DICN 9= LIMIT 10= MIN.RUN.TIM 11= HP SETBACK 12= COMP PR 13= DEFROST BUSY 14= FREEZEUP PR 15= FREEZEUP DIS 16= SAFETY ACT.	Readout compressor status
28	C12Status_XXX	MI		
29	C21Status_XXX	MI		
30	C22Status_XXX	MI		
31	FanC1Status_XXX	MI	0 = Off, 1= LLLL, 2= LLL, 3= LL, 4=Low, 5=Medium, 6=High For OPIF: %	Readout fan status
32	FanC2Status_XXX	MI		

Overview integer values of safety codes

@difference between softcopy input files (installation manual) and print-out@

Value		Message safety menu
0	UNIT SAFETY	No safety
1	UNIT SAFETY	"0F0:EMERGENCY STOP"
2	UNIT SAFETY	"0AE:FLOW HAS STOPPED"
4	UNIT SAFETY	"0C9:INL SENSOR ERR"
5	UNIT SAFETY	"0CA:OUT SENSOR ERR"
6	UNIT SAFETY	"0H9:AMB T SENSOR ERR"
9	UNIT SAFETY	"0U4:EXT PCB COMM.ERR"
10	UNIT SAFETY	"0U4:MAINPCB COMM.ERR"
12	UNIT SAFETY	"0AE:PUMPINTERLOCK"
14	UNIT WARNING	"0AE:FLOW HAS STOPPED"
16	UNIT WARNING	"0C9:INL SENSOR ERR"

Value		Message safety menu
62	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH1"
63	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERRH2"
64	UNIT WARNING	"1J6:COIL1 SENSOR ERR"
65	UNIT WARNING	"1J7:COIL2 SENSOR ERR"
66	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
67	UNIT SAFETY	"0A4:FREEZE UP C1"
70	CIRCUIT 2 SAFETY	"1U1:REV PHASE PROT"
71	CIRCUIT 2 SAFETY	"1E3:HIGH PRESSURE SW"
75	CIRCUIT 2 SAFETY	"1E4:LOW PRESSURE"
77	CIRCUIT 2 SAFETY	"1JA:HP SENSOR ERR"
78	CIRCUIT 2 SAFETY	"1JC:LP SENSOR ERR"

Value		Message safety menu
17	UNIT SAFETY	"0A9:EEV PCB COMM ERR"
18	UNIT SAFETY	"0A9:EEV PCB ERR"
19	UNIT SAFETY	"0UA:OP.NOT CONFIRMED"
29	UNIT SAFETY	"0U5:PCB COMM.PROBLEM"
30	CIRCUIT 1 SAFETY	"1U1:REV PHASE PROT"
31	CIRCUIT 1 SAFETY	"1E3:HIGH PRESSURE SW"
35	CIRCUIT 1 SAFETY	"1E4:LOW PRESSURE"
37	CIRCUIT 1 SAFETY	"1JA:HP SENSOR ERR"
38	CIRCUIT 1 SAFETY	"1JC:LP SENSOR ERR"
42	CIRCUIT 1 SAFETY	"153:FAN INV ERR."
44	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR1"
45	CIRCUIT 1 SAFETY	"1F3:HIGH DISCH TEMP1"
46	UNIT WARNING	"153:FAN OVERC. ST1"
47	UNIT WARNING	"153:FAN OVERC. ST2"
48	UNIT WARNING	"153:FAN OVERC. ST3"
49	CIRCUIT 1 SAFETY	"1A9:EEV ERR"
50	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST1"
51	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST2"
52	CIRCUIT 1 SAFETY	"153:FAN OVERC. ST3"
53	CIRCUIT 1 SAFETY	"1J5:SUCTSENSOR ERR"
54	CIRCUIT 1 SAFETY	"1A9:SUPERHEAT ERR"
56	UNIT WARNING	"1E3:HP SETBACK"
57	UNIT WARNING	"1E6:COMP PR"
58	CIRCUIT 1 SAFETY	"1E6:COMPR 1 SAFETY"
59	CIRCUIT 1 SAFETY	"1E6:COMPR 2 SAFETY"
60	CIRCUIT 1 SAFETY	"1J3:DISCHSENSOR ERR2"
61	CIRCUIT 1 SAFETY	"1F3:HIGH DICH TEMP2"

Value		Message safety menu
82	CIRCUIT 2 SAFETY	"153:FAN INV ERR."
84	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR1"
85	CIRCUIT 2 SAFETY	"1F3:HIGH DISCH TEMP1"
86	UNIT WARNING	"253:FAN OVERC. ST1"
87	UNIT WARNING	"253:FAN OVERC. ST2"
88	UNIT WARNING	"253:FAN OVERC. ST3"
89	CIRCUIT 2 SAFETY	"1A9:EEV ERR"
90	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST1"
91	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST2"
92	CIRCUIT 2 SAFETY	"153:FAN OVERC. ST3"
93	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERR"
94	CIRCUIT 2 SAFETY	"1A9:SUPERHEAT ERR"
96	UNIT WARNING	"2E3:HP SETBACK"
97	UNIT WARNING	"2E6:COMP PR"
98	CIRCUIT 2 SAFETY	"1E6:COMPR 1 SAFETY"
99	CIRCUIT 2 SAFETY	"1E6:COMPR 2 SAFETY"
100	CIRCUIT 2 SAFETY	"1J3:DISCHSENSOR ERR2"
101	CIRCUIT 2 SAFETY	"1F3:HIGH DICH TEMP2"
102	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH1"
103	CIRCUIT 2 SAFETY	"1J5:SUCTSENSOR ERRH2"
104	UNIT WARNING	"2J6:COIL1 SENSOR ERR"
105	UNIT WARNING	"2J7:COIL2 SENSOR ERR"
106	CIRCUIT 1 SAFETY	"1J5:REFR SENSOR ERR"
107	UNIT SAFETY	"0A4:FREEZE UP C2"
190	NETWORK SAFETY	"0U4:PCB COMM.PROBLEM"
191	NETWORK SAFETY	"0CA:OUT E SENSOR ERR"
192	NETWORK SAFETY	"0C9:INL E SENSOR ERR"
194	NETWORK SAFETY	"0U4:SW VERSION ERR"

6 History

<EKBNPG> BACnet configuration file

Information for service manual (public)				Internal use only
Item	Daikin version (date) Daikin title (example 1 unit) Daikin config file (example 1 unit) Daikin reference Software code Software version & date	Applicable units	Content	References, detailed content and bugs.
1	V0.8 (11/09/2007) CN00241 Daikin 1 unit v0.8 configBN_PC_Daikin_1unit_v0_8.csv	EWA/YQ80-260	New	

7 Configuration files

@Is this chapter really necessary? This is already stated at the beginning of the two gateway configuration chapters@

The config files can be found on the Daikin extranet.

http://extranet.daikineurope.com

Index

A

address card
    connection 1–8

B

BACnet object list 3–10, 3–41
BMS
    what is? . . . . . i–ii

C

change IP address 2–28, 3–31
communication
    chiller and BMS 1–4
communication connections 2–6
configuration file 2–43

D

DENV extranet 3–24
Dimensions 3–9
download
    configuration file to gateway 3–24
    procedure 3–25

F

function 3–13

I

installation
    address card 1–7

M

master 1–4
Modbus protocol 1–4, 1–9
Modbus 1–9
monitor communication 2–27, 3–30

O

objects
    LON 2–11
Operation and display signals 3–9

S

safety codes 1–17, 2–42, 3–42
service menu 1–11
slave 1–4
specifications 3–7

W

wiring diagram 3–14